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Ivory in China

Ivory occupies a very prominent place in the art of the Far East, and Chinese carvers in ivory have always stood in the front rank of their craft. But those who have hitherto written on the subject have merely treated it as an art industry, extolling Chinese mastery of technique, skill in execution, and grace of design. Correct as this judgment may be, it is based on more or less modern productions which are distinguished for technical ingenuity rather than for artistic merits. The archæology of ivory and the older real works of art created in this substance have almost wholly been neglected. The object of the present study is to fill this gap, to set forth the importance of ivory in the early antiquity of China, to trace the sources of supply and the development of the ivory-trade, and to interpret the art of ivory in its relation to Chinese life and culture. This essay is divided into five chapters dealing with the elephant in China and the trade in elephant ivory, folk-lore of the mammoth and trade in mammoth ivory, trade in walrus and narwhal ivory, ivory substitutes, and objects made of ivory. It is occasioned by a collection of ivory carvings made by me in China in 1923 (Captain Marshall Field Expedition) and recently placed on exhibition, and may serve as a guide to this collection.

THE ELEPHANT IN CHINA AND TRADE IN ELEPHANT IVORY

The fact that the elephant was known to the ancient Chinese may come as a surprise to many readers. The former existence of the animal on Chinese soil is well authenticated by linguistic, pictographic, historical, and archæological evidence. Not only have the Chinese an old, indigenous word for the pachyderm, but they also possess this word in common with the eastern branch of the family of peoples to which they belong and the languages of which are closely related. The ancient Chinese designation of the elephant was *dziang* or *ziang;* in the modern dialects of the north it is *siang,* in Shanghai *ziang,* in Canton *tsöng,* in Hakka *siong,* in Fu-kien *ch'iong.* In Burmese we correspondingly have *ch'ang,* in Siamese *chang,* in Shan *tsan* or *sang,* in Ahom *tyang,* in Mo-so *tso* or *tson,* in Angami Naga (Assam) *tsu.* This fact of language warrants the conclusion that all these tribes must have been acquainted with the animal from ancient times and even in a prehistoric period when they still formed a homogeneous stock. The Tibetans, akin to the Chinese in language, are outside of the pale of this development and designate the elephant as the "great bull" or the "bull of Nepal" (in the same manner as the Romans when they first saw elephants in the war with Pyrrhus spoke of "Lucanian oxen"), thus indicating that they made its acquaintance only in late historical times on coming in contact with India and Nepal (seventh and eighth centuries A.D.).

The written symbol for the elephant was conceived in ancient China in that early epoch when writing was still in the purely pictographic stage. The primeval pictogram denoting the elephant unmistakably represents it with its principal characteristics,—the trunk, a large head with two protruding tusks, and body with four feet and tail (Figs. 1, 3-6). In Fig. 1

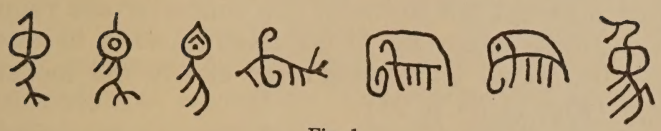

Fig. 1
Archaic Forms of the Written Symbol for the Elephant.

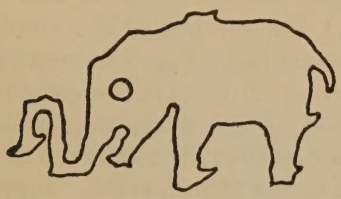

Fig. 2
Elephant from a Bell of the Shang Period, about 1500 B.C.

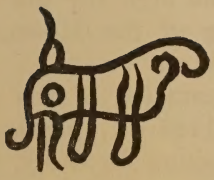

Fig. 3

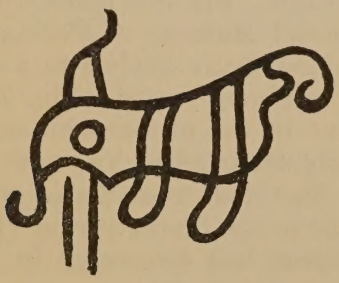

Fig. 4
Symbols of the Elephant from Inscriptions on Bronzes of the Chou Period.

Fig. 5
Elephant from a Bronze Beaker of the Chou Period.

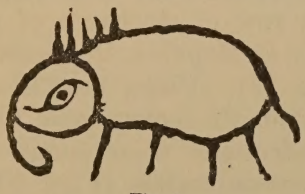

Fig. 6
Elephant from a Bronze of the Shang Period, applied to a Seal of Later Date.

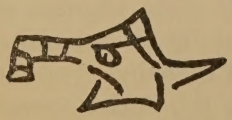

Fig. 7
Elephant Head in the Pictographic Writing of the Mo-so.

seven different old forms of the character are reproduced; these finally led to the stage in No. 7 in about A.D. 100, which approaches very closely the modern form (Fig. 13 on p. 21).

In the inscriptions cast on the archaic bronze vessels of the Shang (1783-1123 B.C.) and Chou dynasties (1122-247 B.C.) the symbol of the elephant is not infrequently represented. Fig. 3 is reproduced from the *Po ku t'u lu* (chap. 2, p. 24), the catalogue of bronzes in the possession of the Sung emperors, published by Wang Fu in A.D. 1107; it occurs on a bronze tripod vessel ascribed to the Chou period. Fig. 4, of the same type, is from a vessel of the same period in a Japanese collection. Fig. 5 is taken from a bronze beaker in the Imperial Museum of Peking. Fig. 6 represents an elephant figure applied to a seal and said to go back to the Shang period. Fig. 7 is the sign for the elephant in the pictographic writing of the Mo-so, an aboriginal tribe in Yün-nan Province.

The most remarkable representation of the elephant in the Shang period (1783-1123 B.C.) occurs in a bronze bell discovered in Shan-tung Province and inscribed with the name of an emperor who reigned 1506-1491 B.C. The rim of this bell is decorated with a row of elephants of naturalistic style (Fig. 2; cf. L. C. Hopkins, Development of Chinese Writing, 1909, p. 15). Under the Chou we usually meet the hieratic, strongly conventional forms, but also very artistic applications of elephant designs to the decoration of bronze vessels (Figs. 8-9).

In the ancient Rituals (*Li ki* and *I li*) are mentioned two types of ceremonial vessels designated as "elephant goblets." The Chinese commentators have exerted their ingenuity in explaining what these vessels are. One says that they were adorned with ivory; another holds that the entire vessel was made in the shape of an elephant; another interprets that it was

decorated with the picture of an elephant; others again take the word *siang* in the sense of "form, image, picture" and conclude that the goblet was adorned with the design of a phœnix. Considering the archæological facts, i.e., the bronze vessels which have come

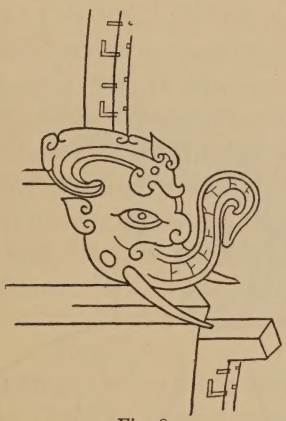

Fig. 8
Elephant Head Projecting from the Side of a Bronze Beaker.

down to us from the archaic period of the Shang and Chou dynasties (1783-247 B.C.), we find a goodly number of these provided with feet shaped into elephant's heads terminating in a trunk, the latter forming the foot of the vessel. This motive is particularly con-

Fig. 9
Elephant Heads as Decorations on a Bronze Vessel.

spicuous in the tripod colanders (called *hien*) which represent the combination of a stove with a cooking-vessel used for steaming grain and herbs in ancestral worship; a charcoal fire was built in the hollow tripod base which is separated by a hinged grate from the

upper receptacle holding the articles to be steamed. A good example of a vessel of this type is on exhibition in the centre of Case 1, Blackstone Chinese Collection. The artistic motive of the elephant-foot in bronzes has persisted in Chinese art throughout the centuries down to the K'ien-lung period (1736-95); it is likewise visible in the Han mortuary pottery (206 B.C.—A.D. 220).

In the monuments of the Han period there are highly naturalistic representations of the elephant in scenes carved on tomb sculptures. One of these illustrated in Fig. 10 is depicted on one of the eight stone

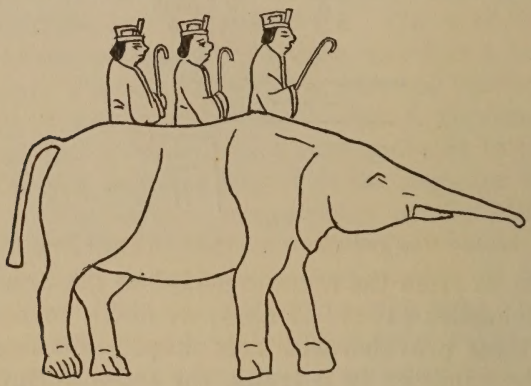

Fig. 10
Elephant on Bas-relief of the Han Period, First Century A.D.

slabs forming the remnants of a mortuary chamber and found on the hill Hiao-t'ang-shan northwest of the city Fei-ch'eng in western Shan-tung. The elephant mounted by three mahouts equipped with iron hooks is shown in a long procession of figures forming the retinue of a "barbarian" prince. It is certain that the elephant did not exist in Shan-tung at that time, but it is equally certain that the Han artist must have drawn the animal from life.

In the beginnings of history the Chinese were restricted to what is now northern China in the valley of the Yellow River, and physical and climatic condi-

tions of the country then were to some extent different from what they are at present: the mountain-ranges were still crowned by dense forests haunted by great numbers of wild beasts among which were elephants. As the farmers (and the Chinese were a nation of farmers) gradually advanced and cleared the jungle, the elephant gradually retreated farther south, or was exterminated. This may have been accomplished by the beginning of the first millennium B.C., but the recollection of the animal survived in the minds of the people for many centuries later. By the middle of the first millennium B.C. the habitat of the elephant became restricted to the Yang-tse Valley, extending from far-west Se-ch'wan to the sea, and the regions still farther south and west, as will be demonstrated hereafter in detail.

An ancient saying, presumably of proverbial character (recorded in the *Tso chwan* under the year 548 B.C.) was to the effect that the elephant has tusks which lead to the destruction of its body, because of their use as gifts.

In the old Book of Songs, the earliest extant collection of Chinese poetry, an allusion is made to elephant-tusks brought as tribute by the wild tribes bordering the river Hwai, which flows through the provinces of An-hui and Ho-nan and empties its waters into the Hung-tse Lake.

Elephant-teeth and rhinoceros-hides were among the products sent as taxes by the two provinces Yang-chou and King-chou,—the former covering the territory south and north of the Yang-tse delta; the latter, the present area of the provinces of Hu-nan and Hu-pei.

In early antiquity elephant ivory was perfectly known and wrought into articles of every-day use like spikes or pins for scratching the head and tips for the ends of bows. Ivory ranked next to jade and gold.

The emperors of the Chou dynasty (1122-247 B.C.) had five kinds of chariots of state, three of which were covered with leather. In the first the ends of the principal parts were decorated with jade; in the second, with gold; in the third, with ivory; while the fourth was of plain leather; and the fifth, of wood. The ceremonial leather cap worn by the emperors was adorned with jade ornaments of various colors, and in the place where it fitted over the nape of the neck, had a foundation of ivory. Confucius is said to have possessed an ivory ring five inches wide.

Memoranda or writing-tablets (*hu*) used by the feudal princes and great prefects were made of ivory, while the emperor had the prerogative of using a polished jade slab for the same purpose. This example shows again that ivory ranked next to jade in value. The ivory tablet of the feudal princes was rounded at the top and straight at the bottom to symbolize that they should obey the Son of Heaven. The tablet of the great prefects was rounded both at the top and bottom to express the idea that they had only superiors to obey. Such tablets were carried suspended from the girdle, and were used as memoranda or for jotting down notes. An official, when he had an audience at court, inscribed his report on the tablet and recorded the emperor's reply or command. At a later time they were reserved for the organs of government and became emblems of dignity.

Chopsticks were originally made of bamboo or wood, but in the time of the Chou dynasty (1122-247 B.C.) were also carved from elephant ivory. According to an ancient tradition, the man who first conceived this innovation, was Chou, the last emperor of the precedig Yin or Shang dynasty, notorious for his debauchery. He was remonstrated for this extravagance by one of his relatives who said, "He makes chopsticks of ivory! Next he will doubtless make a

cup of jade, finally he will think of the precious and extraordinary objects of distant countries, and will have them carted to his place. From that moment he will crave in ever increasing numbers chariots and horses, mansions and palaces, and there will be no way of keeping him off."

Fortunately we now have at our disposal also a few ivory carvings of the archaic epoch. The veteran Chinese archæologist, Lo Chen-yü, made a few of these known in one of his illustrated works in Chinese. They are of the same character as the four objects illustrated here in Plate I. That in Fig. 1 is in the collection of the Metropolitan Museum of Art, New York, the photograph being due to the courtesy of Mr. Bosch-Reitz, curator of the Oriental Department. It evidently is an implement used for untying knots; corresponding implements were made from jade (cf. "Jade," pp. 238-242). It is firmly and handsomely carved with a running animal, a conventionalized animal's head and an eye, all set off from a background formed by a composition of square and triangular spirals. This implement was worn suspended at the girdle, being regarded as a token of maturity; it belonged to the equipment of one growing into manhood and indicated his competency for the management of business, however intricate; it accordingly symbolized a man's ability to solve knotty problems. The objects shown in Figs. 2-4 were obtained by me at Peking in 1923. The plaque in Fig. 2, though bone-like in appearance, is decomposed and calcined ivory; it is deeply incised at both ends with a band of geometric designs. The ivory character of the object in Fig. 3 is unmistakable; it is carved on both sides with designs which are identical with those found in the contemporaneous bronze vessels. This observation also holds good of Fig. 1. Fig. 4 shows the hilt or top of a knife or dagger engraved on both sides with a double row of

angular spiral designs. These examples of ancient ivory carving differ radically in style and technique from any later works in ivory. They certainly do not go to prove that the elephant existed in ancient times in northern China; for it might be argued that the ivory of which they are made was imported as well. The ancient Greeks wrought ivory long before they became acquainted with the elephant. Considering, however, all available evidence, the conclusion may be hazarded that the objects in question were made of indigenous ivory; at any rate, they are good witnesses in confirmation of the ancient records.

While the ancient Chinese were acquainted with the elephant and used its ivory for various purposes, it must be stated, on the other hand, that they do not seem to have taken a deeper interest in the animal. It played no role whatever in their mythology and gave no rise to religious conceptions. It may even be questioned whether the elephant was hunted by the Chinese themselves. We have several ancient descriptions of hunting-expeditions, but none of these alludes to the chase of the elephant. The passage in Mong-tse, that Chou Kung, who died in 1105 B.C., "drove far away the tiger, leopard, rhinoceros, and elephant to the great joy of all people" is the only one from which occasional elephant-hunting on the part of the Chinese might be inferred. It is more probable that the elephant was usually hunted by the aboriginal "barbarous" tribes, who sold the ivory to the Chinese or with it paid their taxes to the imperial government, and that much of the ivory obtained by the Chinese was "dead" ivory (of animals which died a natural death in the jungle). Han-Fei-tse, a philosopher, who lived in the fourth century B.C., observes that men but rarely see a live elephant, but usually encounter the bones of a dead one. Above all,—and this observation bears out the point in question,—the ancient

Chinese never made any effort to tame or train the elephant, as was done by the nations of Indo-China, Java, Ceylon, and India. It was only in 121 B.C. that the first tame elephant was sent to the court of the emperor Wu of the Han dynasty from Nan Yüe; that is, the country in the southeast, at that time inhabited by tribes of Annamese origin. The commentator of the official Annals of the Han Dynasty, Ying Shao, feels obliged, with reference to this passage, to define what a tame elephant is, "It is docile, can make obeisance and rise again, and quickly grasps man's intentions." This, accordingly, was something entirely novel to the Chinese. Subsequently such gifts of trained elephants from the south are mentioned frequently; they made salaams and would even dance, or draw a carriage. Plutarch (*Of Fortune*) writes, "What is bigger than an elephant? But it also has become man's plaything and a spectacle at public solemnities; and it learns to skip, dance, and kneel."

There is an old tradition that when the emperor Shun was buried at Ts'ang-wu, elephants trampled down the earth around his tumulus, so that the land looked like a ploughed field. Ts'ang-wu then was a territory abounding in elephants; it was situated in what is now the district of Ning-yüan in the prefecture of Yung-chou, Hu-nan Province. In ancient times it was part of the state of Ch'u, which was inhabited by a non-Chinese population, presumably a member of the widely diffused Tai stock. It was a warlike and aggressive nation settled in the area now occupied by the two provinces of Hu-pei and Hu-nan on both banks of the middle Yang-tse. In opposition to the Chinese, the inhabitants of Ch'u seem to have tamed the elephant to a certain extent, and elephants were kept at the court of their king. There is one instance on record to the effect that they were even used for purposes of war. In 506 B.C. the kingdom of Ch'u was

invaded and temporarily overrun by the army of the king of Wu, a state on the lower Yang-tse. Defeated in the field, the prince of Ch'u, in order to detain his pursuers, launched against the enemy a flock of elephants with lighted torches tied to their tails. This isolated occurrence does not prove that in ancient central China elephants were really trained and customarily employed for war: the act of the defeated king was rather a counsel of despair resorted to as a last stratagem; had he actually possessed war-elephants, he would have turned them to more effectual use right at the opening of the engagement. The fact, however, remains that in early times the Yang-tse Valley swarmed with elephants, that they were hunted for the sake of their ivory and hides, and also that they were caught, partially tamed, and kept.

The elephant must have survived in the Yang-tse Valley at least until the end of the tenth century A.D. Isolated occurrences of elephants in the ancient territory of Ch'u are still on record during the middle ages: thus we are informed in the Annals of the Sung Dynasty that in A.D. 962 elephants were seen in the district of Hwang-pei (lat. 30°56′, in the prefecture of Han-yang, province of Hu-pei), and subsisted on the crops of the people; at the end of the following year they were captured in the district of Nan-yang (lat. 33°06′, in the province of Ho-nan), and their teeth and skins were sent as a gift to the throne. Again, in A.D. 964, elephants appeared in the same locality, Nan-yang, and were slain by foresters; teeth and skins were dealt with as in the preceding case. In the same year elephants were observed in the districts of Li-yang (lat. 29° 37′) and An-hiang (lat. 29° 22′), in the province of Hu-nan; others were noticed crossing the Yang-tse and entering the district of Hwa-jung (lat. 29° 30′, in the prefecture of Yo-chou, province of Hu-nan), and others even reached the northern part

of the city of Li-yang. In A.D. 966 elephants arrived spontaneously at the capital.

In the western part of the empire, the present province of Se-ch'wan, formerly styled Shu, elephants are noted in early records, and survived there at least into the period of the two Han dynasties (206 B.C.-A.D. 220), during which they were sent as tribute by the native chieftains to the court of the emperor at Ch'ang-an, where they were kept in the imperial animal-park. The Han emperors were exceedingly fond of curious and exotic animals and plants, and organized a sort of natural history museum in their palaces.

The present province of Yün-nan was originally inhabited by a stock of peoples designated as Tai or Shan, the forbears of the Siamese. They formed a powerful kingdom which was destroyed by the Mongols in A.D. 1252. The Tai were a warlike and chivalrous nation, and had a highly organized army. Military service was compulsory, and every adult was a soldier. The capital, Ta-li, was the centre of the military industry, where harness and helmets were manufactured from elephant skins.

As early as the second century B.C. an unsuccessful Chinese mission, sent out for the exploration of the southwest, received a dim knowledge of an "elephant-riding nation" living farther to the south and west. This was the ancient Tai kingdom, where the elephant played an important part in the life of both rulers and people, in court pageantry, as a riding and draught animal, and as a beast of burden. The elephant was native to this region and plentiful. Fan Cho, who in A.D. 860 wrote an interesting account of the aboriginal tribes of Yün-nan (*Man shu*), says that elephants occurred there in large numbers, and were caught by men who kept many of the animals to draw their ploughs. The same is also reported by subsequent authors, for instance, by T'an Ts'ui in 1799. Liu Sün,

who lived toward the end of the ninth century and who wrote an interesting work on the products of southern China (*Ling piao lu i*), observed in Yün-nan that every family kept elephants for carrying loads over long distances, exactly as oxen and horses were used in China.

The Chinese received their first knowledge of India when Chang K'ien, during his memorable mission to the western countries, sojourned a year in Bactria in 128 B.C., and was informed that the people of India rode on elephants to fight in battle. Subsequently the Chinese also learned the fact that war-elephants were employed in Persia and Camboja, the latter country being reported to have two hundred thousand of them. The introduction of fire-arms put an end to the use of elephants in war, and the Chinese themselves demonstrated the futility of this mode of military tactics. In A.D. 1388, while Mu Ying was governor of Yün-nan, he gained an overwhelming victory over the Burmese, his cannon and powerful crossbows proving too much for the mailed elephants; and in the following year Burma acknowledged the suzerainty of China. In Yün-nan the elephant survived longer than anywhere else in China, and it may still occur here and there in outlying jungles. The native tribes use bracelets and large ear-rings of ivory.

In the two southeastern provinces, Kwang-tung and Kwang-si, elephants have always been numerous and persisted through many centuries. The provinces of Kwang-si and Yün-nan are still given in the *Ko ku yao lun* (written by Ts'ao Chao in A.D. 1388) as producing ivory. The same work lists Tonking and the countries of the Southern and Western Barbarians (Siam, Burma, India) as sending ivory to China. The ivory of the Southern Barbarians is extolled as long and large; that of Kwang-si and Annam is de-

scribed as small and short, and a kind yielding a red powder when cut by a saw was regarded as very excellent.

In the seventh century A.D. the animal was still plentiful in Tonking, as well as in the prefectures of Ch'ao-chou, Hui-chou and Lei-chou of Kwang-tung Province, and was captured by the natives who regarded its flesh, especially that of the trunk, as a great delicacy. The tusks of the Kwang-tung variety are described as small and red, very suitable for ivory tablets. Chinese writers, further, emphasize the fact that their elephants were all dark or black in color, while white elephants are ascribed to the distant lands of the Arabs, of Fu-lin (Syria), and India. A white elephant was sent to China from Gandhāra in A.D. 509. It was kept in a special building near the capital Lo-yang in Ho-nan Province. A white elephant was sent from Burma to Hui Tsung, emperor of the Sung dynasty, in A.D. 1105.

At Canton elephants were employed as late as the tenth century in putting criminals to death. P'eng Ch'eng, who lived in the first half of the eleventh century, writes in his *Mo k'o hwi si*, "In the district of Chang-p'u (lat. 24° 07′) in Chang-chou fu (Fu-kien), which is adjoined to Chao-yang fu (in northern Kwang-tung), there are still numerous elephants usually encountered in herds of ten, yet they are harmless. Solely the rogue elephant pursues men and tramples them down till their flesh and bones are reduced to a pulp. Of all elephants, the rogue elephant is the most ferocious."

Chou Ta-kwan visited Camboja in A.D. 1295-97, and in his Memoirs on the Customs of Camboja writes, "The ivory from the tusk of an elephant killed by means of a pike is considered best; next in quality is the ivory of an animal which was found shortly after

it died a natural death, while least esteemed is that discovered in mountains many years after the animal's death." This observation, which the Chinese learned from the Cambojans, is quite correct; and the Chinese have adopted this rule until the present day. Even in their materia medica the tusks of slain elephants are preferred to those who have died of a disease or otherwise. It has been noted that the "dead ivory" (taken from a dead animal some time after its natural death) is always dull, and when used, will be covered with brown spots of irregular size and very opaque.

The Chinese have also preserved much curious folk-lore in regard to the elephant. It was believed that the designs in elephant tusks were formed when the animal was frightened by a peal of thunder, while the patterns in the horn of the rhinoceros were supposed to be produced when the animal was gazing at the moon. This notion has reference to the "engine-turned" pattern (similar to that on the back of a watch-case) which ivory displays in cross section. It is probably due to this peculiarity of internal structure that it possesses the high degree of elasticity which forms one of its most valuable properties.

Pliny writes that the elephants, when their tusks have fallen out either accidentally or from old age, will bury them in the ground. The ancient Chinese told a similar yarn, according to which the animal would shed its tusks regularly and hide them in a hole dug by itself for this purpose; in order to take them away, it was necessary to leave a pair of wooden teeth in their place, so that the animal would not notice the theft. In regard to the rhinoceros it was also believed that it annually sheds its horn and that a wooden horn must be deposited in lieu of the real one when picked up. These notions were naturally prompted by the observation that detached tusks and

horns were occasionally found in the wilderness, which suggested to the people a natural process akin to the shedding of cervine antlers.

During the middle ages ivory was imported into China, chiefly by the Arabs, from several states in the Malay Peninsula, from Java, Borneo, the eastern coast of Sumatra, southern India, and from the Somali Coast of eastern Africa. The Chinese of the twelfth century knew perfectly well that the African ivory was best of all, and speak of African tusks as reaching a weight of over a hundred pounds. Ivory then was a sort of government monopoly in China inasmuch as the merchants who desired to import it required an official license for tusks weighing thirty pounds or over. The tusks imported by the Arabs are described by a contemporary observer as being straight and of a clear, white color, with patterns displaying delicate lines. In weight they varied from fifty to a hundred pounds, whereas the tusks coming from Tonking and Camboja were small, weighing only from ten to twenty or thirty pounds, and had a reddish tint. The African ivory was designated as "great ivory" (*Ling wai tai ta,* written by Chou K'ü-fei in 1178). In the African species both sexes are furnished with tusks of large size, while in the Asiatic species they are generally restricted to the males, and even then are but poorly developed. Masudi, an Arabic geographer (A.D. 983), informs us that Arabic ships brought the ivory of the Zenj, as the Negroes were called by the Arabs, into the country of Oman on the east coast of Arabia, whence the traders transhipped it to India and China, adding in a tone of regret that ivory would be plentiful in the Musulman countries were it not directed to foreign ports. He further states that the tusks entirely straight or but little curved are held in high esteem by the Chinese and that these serve for the manufacture of palanquins for persons of high rank;

no important official would dare present himself in the palace of the king in a chair made of another material than ivory. Masudi writes also that the Negroes themselves made no use of ivory and did not understand, like the Hindu, to tame the elephant. It is noteworthy that the large straight tusks command the highest price in China even at the present time.

Kubilai (A.D. 1214-94), the great Mongol sovereign of China, was famed for the large number of elephants in his possession. The nucleus of his stock was formed by two hundred animals captured in a fierce battle of the Mongols against the Burmese in A.D. 1277. The king of Burma, as Marco Polo informs us, opposed the invaders with two thousand elephants, "on each of which was set a tower of timber, well framed and strong, and carrying from twelve to sixteen well-armed fighting men." The elephants could not withstand the force of the Mongol arrows, but turned tail and fled. In another chapter Polo relates that the Great Khan's elephants amounted fully to five thousand and that they were exhibited on the New Year's festival, all covered with rich and gay housings of inlaid cloth representing beasts and birds, while each of them carried on its back two splendid coffers filled with the emperor's plate and other costly furniture required for the court on the occasion of New Year. On his hunting expeditions the Great Khan was carried upon four elephants in a fine chamber made of timber, lined with plates of beaten gold, and covered with tiger skins.

The Manchu emperors still maintained an elephant stud, and the emperor K'ien-lung (1736-95) had sixty of them. When the emperor, on the evening before the winter solstice, proceeded to the Altar of Heaven to offer sacrifice at dead of night, he mounted a carriage drawn by an elephant.

E. Ysbrants Ides, envoy of the Russian czar to the emperor of China in the years 1692-95, reports, "The emperor's life-guards were clothed in red calico, printed with red figures, and wore small hats with yellow feathers. They were armed with scimitars and lances. There were eight white saddle-horses for show. In the third court of state were four extraordinarily large elephants, one of which was white. They were all covered with richly embroidered cloth, and their trappings were ornamented with silver gilt. On their backs was a finely carved wooden castle spacious enough for eight persons. Being taken out of the court, I mounted one of the emperor's two-wheeled carts, and was drawn to my apartment by an elephant. There were ten persons on each side with a rope in their hands fastened to the elephant's mouth to lead him; and on his neck sat a man with an iron hook to guide him. He walked at his ordinary rate of speed, but this obliged the men to run, in order to keep up with him. In the emperor's stables there were fourteen elephants: they made them roar, sing like a canary, neigh, blow a trumpet, go down on their knees, etc. All these elephants were extraordinarily large, and the teeth of some a full fathom long. The mandarins told me that the king of Siam annually sends several by way of tribute."

John Bell of Antermony, when he was at Peking in 1721, observed, "After dinner we saw the huge elephants richly caparisoned in gold and silver stuffs. Each had a driver. We stood about an hour admiring these sagacious animals, who, passing before us at equal distances, returned again behind the stables, and so on, round and round, till there seemed to be no end of the procession. The plot, however, was discovered by the features and dress of the riders: the chief keeper told us there were only sixty of them. The emperor keeps them only for show, and makes no

use of them, at least in these northern parts. Some of them knelt and made obeisance to us; others sucked up water from vessels, and spouted it through their trunks among the mob, or wherever the rider directed."

The Earl of Macartney, when sent as ambassador of Great Britain to the emperor of China in 1792, still saw the elephants in the imperial palace, and remarks that they were brought to China from the neighborhood of the equator, and a few of them were bred to the northward of the Tropic. The Chinese elephants, he says, are smaller than those of Cochin-China, and of a lighter hue; they are literally granivorous, being generally fed with rice and millet, though the food of that animal in its wild state consists more frequently of the tender leaves of trees and shrubs than of the seeds or blades of corn or grass.

In a description of Peking inserted in the *Chinese Repository* for 1834 it is said that at that time not more than eight or ten elephants were kept in the Siang Fang ("Elephants' Palace") and were used to increase the pomp of some processions and ceremonies of the emperor. When I visited the building in question in 1901, there were no more elephants there.

While it is not the object of this article to survey the whole development of the elephant motive in Chinese art, which would require a profound study of Indian-Buddhistic subjects, a few remarks may be added here in order to assist the reader in a better understanding of some representations of the elephant in the Museum collections. The *Po ku t'u lu* of Wang Fu (chap. 7, p. 8) and the *Si ts'ing ku kien* (chap. 9, pp. 25, 26), the catalogue of the bronzes of the emperor K'ien-lung published in 1749, which follows Wang Fu's authority, illustrate and describe bronze figures of elephants carrying a vessel on their backs and assign these to the Chou period. This date, how-

ever, is merely prompted by the fact that "elephant-vases" (*siang tsun*), as already mentioned, are spoken of in the ancient Rituals. The art of the Chou, in fact, represented the elephant only in a strongly conventionalized, hieratic form, but never in that realistic manner manifested by the elephant-vases of the two Chinese catalogues. These obviously exhibit the style of the Indian-Buddhistic elephant with smiling eyes and harnessed with neat trappings. These objects, therefore, cannot be older than the age of the T'ang (A.D. 618-906), and this type has ever since been favorite with the bronze founders and potters. The Museum has a good elephant figure of this type of cast bronze coming down from the Sung period (Fig. 14). For comparative purposes are added two elephant designs of the T'ang period (A.D. 618-906) in Figs. 11 and 12,

Fig. 11
Brass Chessmen with Designs of Elephants. T'ang Period (A.D. 618-906).

Fig. 12

Fig. 13
Ivory Chessman bearing Written Symbol of Elephant (Modern Form).

which appear on brass chessmen; these are as large and as flat as coins and, on the obverse, bear the character *siang* ("elephant"), in the same manner as in the modern ivory chessmen (Fig. 13), which are solely provided with the characters for the men, not with their figures as was customary under the T'ang.

In the K'ien-lung period (1736-95) the elephant was a favorite art-motive. Many good examples of its application to bronze vessels may be seen in Case 24 of the Blackstone Chinese Collection. In a censer shown there both the three feet and the two handles

are formed by realistic figures of elephants; the cover is surmounted by the figure of a recumbent elephant on which astride is a turbaned Mohammedan. In another censer the elephant on the cover carries on its back a basket filled with coral branches, jewels, and rhinoceros-horns intended as gifts for the emperor. There is also a set of five altar-vessels in which the

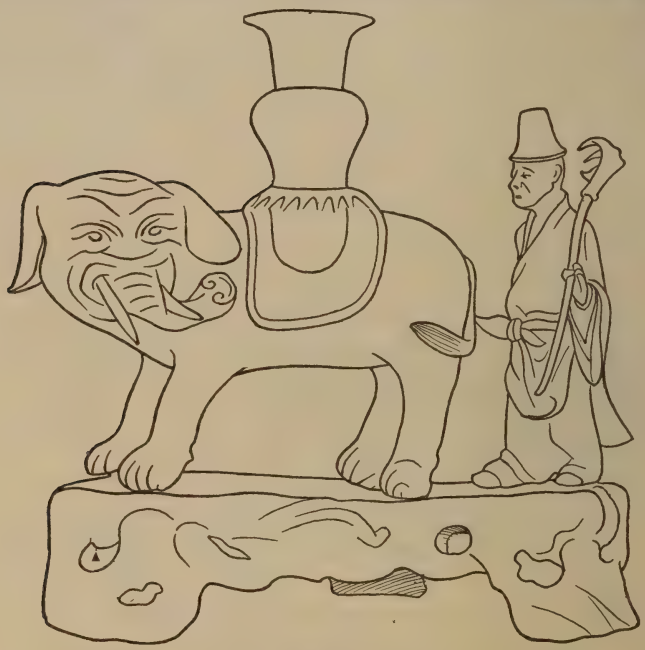

Fig. 14
Bronze Figure of Elephant Followed by Mahout. Sung Period (A.D. 960-1278). Specimen in Blackstone Chinese Collection.

elephant is the leading artistic motive; the ornaments in the animal's caparison and trappings are indicated by inlaid coral and turquois beads. In Fig. 15 the bronze figure of an elephant of the period is shown.

In India the elephant was modelled in art at an early time. In the Museum's collection of Gandhāra sculptures (Case 37, Hall 32) may be seen a small

stone figure representing an elephant of naturalistic style (first or second century A.D.).

Live elephants were transported from India to Samarkand and Khotan and thence overland to China.

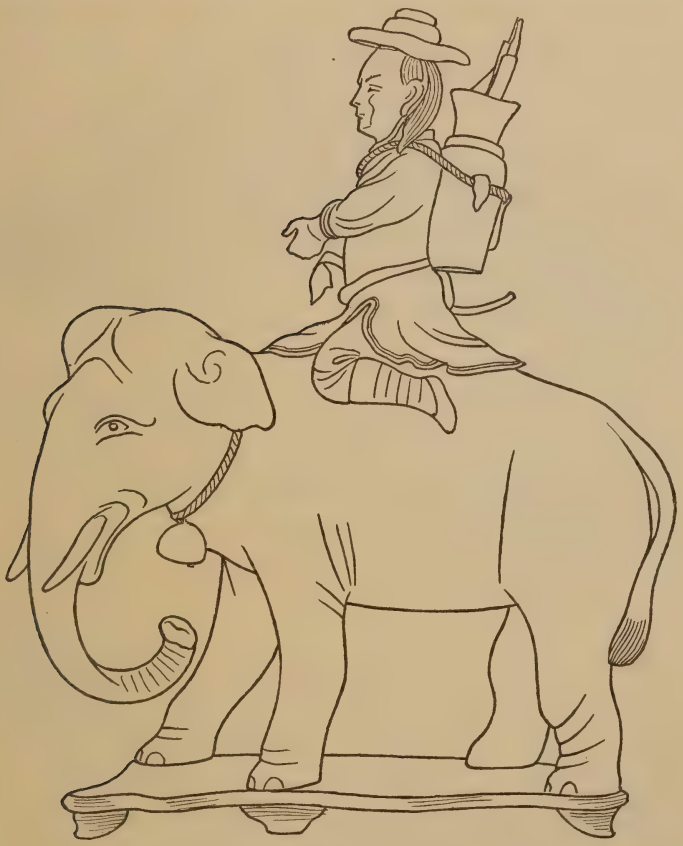

Fig. 15
Bronze Figure of Elephant (K'ien-lung Period).
Specimen in Blackstone Chinese Collection.

Images of elephants were brought along the same trade route, and were distributed over Central Asia, Siberia, and Russia. In this manner peoples who had never before seen an elephant became familiar with its

likeness through models distributed from India. Small elephants of metal have been found in Russian soil, one of bronze in the Government of Yekaterinoslav and another of silver beyond the Ural, worshipped by the Ostyaks as an idol. The former is decorated with a purely Indian ornament, the so-called çrivatsa, an emblem of Çiva, which has become widely known also in China. It must hence be inferred that this bronze elephant found in Russian soil is of Indian workmanship, and was imported into Russia.

The elephant is quite capable of standing cold climates. The trip of an elephant to the northernmost part of Sweden (lat. 64°) is on record in the *Smithsonian Miscellaneous Collections* (Vol. 47, 1905, p. 517).

FOLK-LORE OF THE MAMMOTH AND TRADE IN MAMMOTH IVORY

The ancient Chinese had a certain knowledge of the mammoth (*Elephas primigenius*), though blended with marvelous details and embedded in the ground of folk-lore rather than based on correct observations. The interesting point is that Chinese traditions regarding the animal show a striking resemblance to those of Siberian tribes. The *Shen i king*, a book of wondrous tales, traditionally ascribed to Tung-fang So, minister to the emperor Wu of the Han dynasty (140-87 B.C.), contains the following passage: "In the regions of the north, where ice is piled up over a stretch of country ten thousand miles long and reaches a thickness of a thousand feet, there is a rodent, called *k'i shu*, living beneath the ice in the interior of the earth. In shape it is like a rodent, and subsists on herbs and trees. Its flesh weighs a thousand pounds and may be used as dried meat for food; it is eaten to cool the body. Its hair is about eight feet in length, and is made into rugs, which are used as bedding and

keep out the cold. The hide of the animal yields a covering for drums, the sound of which is audible over a distance of a thousand miles. Its hair is bound to attract rats. Wherever its hair may be found, rats will flock together."

Another term for the mammoth was *fen,* a name which refers properly to a species of mole (*Scaptochirus moschatus*); it was also called "the hidden rodent" (*yin shu*). Hence T'ao Hung-king (A.D. 452-536), a distinguished physician and celebrated adept in the mysteries of Taoism, and Ch'en Ts'ang-k'i, who wrote a materia medica in the beginning of the eighth century A.D., speak of two animals of the name *fen* and discriminate between *fen* as a small mole and the *fen* of the size of a water-buffalo, which may be identical with the mammoth. The earliest definition of the animal *fen,* as given in the ancient dictionary *Erh ya,* is that of "an animal which moves in the ground." As the same was supposed in reference to the mammoth, it is easy to understand how the name was transferred from a burrowing mole to a creature apparently resembling it in subterranean habits. It is striking, however, that in none of the Chinese traditions any allusion is made to the ivory-furnishing tusks.

To some extent the Chinese were also acquainted with fossil ivory. Their materia medica registers two famous articles known as "dragon's bones" and "dragon's teeth," offered for sale by drug-stores. The former have been examined microscopically by D. Hanbury (Science Papers, p. 273) and proved to be, at least in some cases, fossil ivory. Fossil bones of *Stegodon orientalis* of Swinhoe are brought from Sech'wan Province in large broken masses, showing the cancellous structure of the large fossil bones of proboscidians. Portions of limestone matrix bearing the impressions of these bones are sold together with these genuine fossils. They are powdered and used in ague,

fevers, hemorrhages, and fluxes. The "dragon's teeth," usually found in marshy ground of Se-ch'wan, also in Shen-si and Shan-si, consist of fossil teeth of *Rhinoceros tichorhinus*, *Stegodon sinensis* and *Stegodon orientalis*, horns of *Chalicotherium sinense*, teeth of *Hyla sinensis*, and molars of horses, mastodons, elephants, and hippotherium. They are supposed to act on the liver and to be of great service as cordial or sedative remedies. In a lot of dragon's teeth obtained by me for the American Museum of Natural History, New York, in 1902, were found one tooth of a mastodon, five teeth of a rhinoceros, two molars of an hipparion, and one tooth of an undescribed hipparion. Dragon's bones from T'ai-yüan in Shan-si and Tsin-chou in Chi-li are mentioned as early as the T'ang period (A.D. 618-906).

The Chinese, moreover, possess a certain number of accounts which allude to the discovery of fossil animal-bones, particularly in Yün-nan and Se-ch'wan, and which are explained by the people as the remains of saints or fairies, in the same manner as we have the giants' bones in European folk-lore. These notices are so vague, of course, that it is impossible to determine the character of these bones. There are other Chinese descriptions of fabulous animals found in Chinese soil which led some European writers to the conclusion that the Chinese of historical times were personally acquainted with the mammoth. This, however, is extremely doubtful and, at any rate, is of no interest to archæology, as it is not known that the Chinese ever made any industrial use of mammoth or any other fossil bones. The "dragon's bones" and "dragon's teeth" were employed medicinally, but for no other purpose.

In the years 1712-15, a Chinese embassy traversed Siberia on its way to the Volga for the purpose of inducing the Torgut, a Kalmuk tribe who had settled

there under Russian protection, to return to their old homes on the Chinese frontier. The Manchu Tulishen, the envoy, writes in his Memoirs in reference to Yenisseisk, "In the coldest parts of this northern country is found a species of animal which burrows under the ground, and which dies when exposed to the sun and air. It is of enormous size and weighs ten thousand pounds. Its bones are very white and bright like ivory. It is not by nature a very powerful animal, and is therefore not very ferocious. It generally occurs on the banks of rivers. The Russians collect the bones of this animal, in order to make cups, saucers, combs, and other small articles. The flesh of the animal is of a very cooling quality, and is eaten as a remedy in fevers. The foreign name of this animal is *mo-men-to-wa* [i.e. mammoth]; we call it *k'i shu.*" The transcription is based on Russian *mamontowa* (scil. *kost,* "bone"). It is interesting to note that this Manchu official, apparently well read in the literature of China, had wit enough to identify the earth-wanderer of ancient lore with the mammoth of whom he heard in Siberia. The *Ts'e yüan,* a modern Chinese cyclopædia published by the Commercial Press of Shanghai, quotes a portion of his text in proof of the fact that the word *fen* denotes the mammoth.

In 1716 the emperor K'ang-hi, who was fond of natural history, wrote, "The books say that in the very cold regions of the north ice forms to a thickness of a hundred feet and melts not even in the spring or summer. This region is now known actually to exist. Again, the *Yüan kien lei han* contains the following statement: 'The *k'i shu,* which is described as reaching the weight of ten thousand pounds, is found even at the present day. In shape it resembles the elephant, and its tusks are like those of the same beast, but the ivory is yellowish in color.' In both these points, the ancient books are confirmed." Again, in 1721, in the

sixtieth year of his reign, the venerable sovereign recurred to the same topic in an address to his ministers, "While all the assertions found in books are not to be implicitly believed, there are, on the other hand, statements which, however false and absurd they may seem, are nevertheless perfectly well founded. Thus, for instance, Tung-fang So relates that in the regions of the north ice is formed to a thickness of a thousand feet, and does not melt either in the winter or summer. When the Russians presented themselves at our court this year, they stated that in their country, at a distance of something over twenty degrees from the Pole, there is what is called the Polar Sea. The ice lies frozen there in solid masses and prevents the access of human beings. Thus, for the first time, the truth of Tung-fang So's assertion has been confirmed. Again he states that in the northern regions, under layers of ice, is found a large animal of the kind of a rodent, the flesh of which weighs a thousand pounds. Its name is *fen shu*. It burrows under the ground and dies when it sees the light of the sun or moon. Now, in Russia, near the shores of the northern ocean, there is a rodent similar to an elephant, which makes its way under ground and which expires the very moment it is exposed to light or air. Its bones resemble ivory, and are used by the natives in manufacturing cups, platters, combs, and pins. Objects like these we ourselves have seen, and we have been led thereby to believe in the truth of the story."

In 1666, the learned Hollander Nicolaus Witsen, who subsequently became mayor of Amsterdam, paid a visit to Moscow, where he collected the materials for his work "Noord en Oost Tartarye," which appeared in 1694. This work introduced for the first time the name *mammoth* to western Europe. Witsen describes how elephants' teeth are found in large numbers on the banks of Siberian rivers, and adds, "By the in-

landers (the Russian settlers in Siberia) these teeth are called *mammouttekoos* (for Russian *kost*, "bone"), while the animal itself is called mamout." Ludolf (Grammatica russica, p. 92, 1696) writes that the Russians believed the teeth of the mammoth to belong to an animal living underground, larger than any above ground. They used it in physic in lieu of and for the same purpose as unicorn's horn (narwhal tusk). The more sensible among the Russians affirmed these teeth to be of an elephant, brought thither at the time of the deluge.

The etymology of the word *mammoth* is obscure. The Russian form is *mamont* or *mamut*. It has been suggested by Strahlenberg that the word is derived from *behemoth* (see below, p. 63) through the medium of an Arabic *mehemoth*. Howorth has accepted this theory, but it is by no means convincing. Byron (*The Deformed Transformed*, III, 1) has confronted the two animals:

> When the lion was young,
> In the pride of his might,
> Then 'twas sport for the strong
> To embrace him in fight;
> To go forth with a pine
> For a spear, 'gainst the mammoth,
> Or strike through the ravine
> At the foaming behemoth;
> While man was in stature
> As towers in our time,
> The first born in Nature,
> And, like her, sublime!

According to the conception of the Samoyeds, the mammoth is a gigantic beast which lives in the depth of the earth, where it digs for itself dark pathways and feeds on earth. They call it "stallion of the earth" or "the master of the earth." They account for its corpse being found so fresh and well preserved by assuming that the animal is still alive. Death, however,

they contend, is the fate of any one who has the misfortune to meet on his way the bones of the master of the earth; and if he is to ward off this penalty, he must sacrifice a reindeer to the demons. This entitles him to the possession of the bones and to using or selling them as he pleases.

In the country of the Ostyaks on the Irtysh mammoth-bones are sometimes found in the slopes of steep banks after a landslip. Some of the Ostyaks look upon them as water-sprites, others regard them as sacred animals living under ground and call them "earth-oxen." They cannot bear the daylight and must die when reaching the surface of the earth (cf. the similar Chinese notion above). Pieces of mineral coal which occur on the banks of some rivers are regarded as the livers of mammoths. They subsist on tree-roots and hence dig up the earth, so that they undermine the river-banks and finally cause their collapse. They are also fond of residing in the depth of streams and lakes, and their presence is announced by the agitation of the water and whirlpools. Such places in rivers which are looked upon as abodes of mammoths are considered sacred, and nets must not be cast into the water. They do not even like to draw there water for drinking. In the winter the animals sometimes rise to the surface of the water, break the ice, and cause a tremendous noise. They are harmless to man and cannot grant him luck in his enterprises or health; yet the offerings made to them during a journey insure its successful completion by guarding against landslips and ice-breaks. Other animals when grown old may undergo a metamorphosis into mammoths; elks and reindeer, even bears, may change their status for a life in the depth of the waters when mammoth-horns will grow on them. Old pikes are said sometimes to choose the deepest spots of lakes where moss will grow on their heads and horns on their front, whence it is

concluded that old pikes also are gradually transformed into mammoths. In this form they are called pike-mammoth.

The Samoyeds designate the mammoth "earth-bull" or "earth-stag." The former epithet is applied to it also by the Wogul, a Finno-Ugrian tribe. The Mongols and Manchus speak of the "ice-rodent."

The Buryats, a branch of the Mongols living around Lake Baikal, call the mammoth *arslan* ("lion") or *arsalyn zan* ("lion-elephant"). They believe that its bones represent a smashed dragon (*lu*). When the dragons have grown old, they take refuge in the earth. The animal is further connected with the Biblical story of the flood: it boasted that it could not perish on account of its size, and refused to enter the ark. It swam around for several days, but was finally drowned. Hence its bones are now found in the ground. The Russians of Transbaikalia have a similar story, adding that while the mammoth was floating, birds perched on its "horns," as they could not find a dry place; for a long time it struggled against the flood, but the birds increased to such a number that its strength finally dwindled, and it perished after a few days.

In 1611 an English navigator, Jonas Logan, visited the land of the Samoyeds and returned to London with an elephant's tooth which he had bought from them. This presumably was the first mammoth tooth that came to England. The Scotch traveller, Bell of Antermony, observed in most of the towns which he passed between Tobolsk and Yenisseisk many mammons' horns, so called by the natives. Some of them were very entire and fresh like the best ivory in every circumstance excepting only the color, which was of a yellowish hue; others of them mouldered away at the ends and, when sawn asunder, were prettily clouded. The people made snuff-boxes, combs, and diverse sorts of turnery-ware of them. "I brought a large tooth

or mammons' horn with me to England," he adds, "and presented it to my worthy friend, Hans Sloane, who gave it a place in his famous museum, and was of opinion also that it was the tooth of an elephant. This tooth was found in the River Obi at a place called Surgut." The Russians developed a lively trade in mammoth ivory from the latter part of the eighteenth century when Liakhoff, a merchant, discovered vast stores of mammoth bones between the rivers Khotanga and Anadyr and obtained the exclusive right to dig for them. The quantity of fossil ivory which was sent from Siberia to the European markets was enormous. In 1821, an ivory-hunter from Yakutsk brought back twenty thousand pounds of ivory, each tusk weighing on an average about a hundred and twenty pounds. In the London market as many as 1,635 mammoth tusks were sold in a single year, averaging 150 pounds in weight; of these 14 per cent were of the best quality, 17 per cent inferior, while more than half were useless commercially. The total number of mammoths represented by the output of fossil ivory since the Russian colonization of Siberia is estimated as not being far from forty thousand.

Vague allusions to the mammoth loom up also in the writings of the Arabs of the middle ages. Thus al-Beruni (A.D. 973-1048), in his discussion of the substance *khutu*, which, as will be seen in the following chapter, applies in the main to walrus ivory, remarks that it is the frontal bone of a bull who lives in the country of the Kirgiz. In an Arabic chronicle, written in A.D. 1076, are mentioned teeth resembling the tusks of elephants which were obtained in the country of the Bulgars who at that time lived on the Volga. These teeth were thence exported to Kharizm (now Khiva), where they were wrought into combs, boxes, and other objects. Abu Hamid, who visited the country of the Bulgars in A.D. 1136, observed there

"a tooth four spans long and two spans wide and the cranium of the animal resembling a dome; teeth were also found in the ground like elephant's tusks, white like snow, one weighing two hundred *menn;* it was not known from what animal it was derived; it was wrought like ivory, but was stronger than the latter and unbreakable."

It is possible, as is assumed by several scholars, that the question is here of mammoth tusks; but it is equally possible that it was simply elephants' tusks. P. S. Pallas (Reise durch verschiedene Provinzen des russischen Reichs, Vol. I, p. 140, 1801) found in the Volga territory several bones and even the cranium of an elephant on the banks of a rivulet; at Simbirsk he saw some objects wrought from the ivory found there and which could not be distinguished from "healthy" ivory; only the tip of the tooth had undergone a certain degree of calcination. Another elephant's tusk found on the bank of that rivulet he describes as having assumed an intensely yellow color. Similar discoveries may have formed the source of supply for the Bulgar ivory.

The Chinese were acquainted with Kharizm as early as the T'ang dynasty and emphasize the point that it was the only country of western Asia, where carts drawn by oxen were to be found and that the merchants travelled around in these vehicles. In A.D. 751 a prince of that country sent an embassy to China with gifts. The ancient capital of the country, Urgenj, was captured and destroyed by the Mongols in A.D. 1221. Khiva, the present capital of Kharizm or the Khanate of Khiva, is situated about a hundred miles southeast of ancient Urgenj. If Kharizm was a centre of the mammoth-ivory industry during the middle ages, we receive in this manner a clew as to how this material may have found its way to China.

In the work of the learned Philipp Johann von Strahlenberg, which appeared at Stockholm in 1730, we are informed that great quantities of white mammoth tusks were carried from Siberia for sale to China. Strahlenberg was a Swedish officer in the service of Charles XII, was taken prisoner by the Russians in the battle of Pultava, and resided in Siberia for thirteen years. It is only surprising that Strahlenberg characterizes these teeth exported to China as white, while in the same breath he describes mammoth tusks as yellow, some as brown as coconuts and even black-blue. It has therefore been suggested by Ranking that the teeth in question were walrus teeth.

"In the northern part of Siberia, so great is the abundance of mammoth tusks, that for a very long period there has been a regular export of mammoth ivory, both eastward to China and westward to Europe" (N. N. Hutchinson, Extinct Monsters, p. 183). This view, however, must be adopted only with certain reservations. As far as the last three centuries are concerned, it is without any doubt correct, but going beyond the seventeenth century, the matter becomes one of uncertainty, and we have no definite evidence either archæological or historical. The archæology of Siberia is fairly well known, and no ivory has as yet been discovered there in any grave or otherwise. The notices of the Arabs given above refer to tusks found in the territory of the Volga, but the Arabs never had any knowledge of the Siberian mammoth. As will be seen in the following chapter, what the Arabs traded was chiefly walrus ivory. In regard to the Chinese we are confronted with a puzzling fact: they have ancient traditions and certain notions of the mammoth as an animal, but they never allude to its tusks or ivory. Only as late as 1716 the emperor K'ang-hi learned from

the Russians that the animal furnishes ivory, and about this time the same fact dawned upon the envoy Tulishen when he was in the heart of Siberia. Previously, however, the Chinese, if we rely on their literature, possessed no knowledge of mammoth ivory. Howorth argues that "from early times mammoth ivory was sent from Siberia to China, that the Chinese had a knowledge of Siberia and its products from a very early time, a fact not otherwise improbable," and he adds that the throne which Carpini describes as having been made for the great Mongol Khan Kuyuk by the jeweller Cosmas out of ivory was doubtless made from fossil ivory, showing it was well known in Mongolia in the thirteenth century. Carpini, in his Latin text, uses merely the word "ivory" (*ebur*), and considering the vast number of elephants kept in the empire of the Mongols (above, p. 18), there is no reason why Kuyuk's throne could not have been made of plain elephant ivory as well. True it is, as Howorth says, that from an early date the Chinese were well acquainted with the peoples and products of Siberia; in fact, nearly all we know about this subject in times prior to the Russian occupation we owe to the official annals and other records of the Chinese. They tell us a great deal about the fine Siberian peltry like the sable, marten, fox, lynx, beaver, but never mention any ivory used by a tribe of Siberia or imported from there into China. This silence surely is not fortuitous, it is ominous. Considering the movements and migrations of the former peoples inhabiting Siberia, it is most unlikely that the northernmost parts of the country were inhabited in very early times. These inhospitable regions were only the refuge of weaker tribes who were gradually pushed northward by more powerful neighbors. It was in the tundras and along the littoral of northern and northeastern Siberia that most of the remains of the mammoth were discovered, and

this was possible only in times after the northward movement of the tribes.

There is another reason why a history of the trade in mammoth ivory cannot be written with an absolute degree of certainty or cannot be given, so to speak, a clean bill of health. The accounts we have are confused, and in many of them the tusks of mammoth, walrus and narwhal, and even fossil rhinoceros-horn, are hopelessly mixed up. These various products are all comprised in Siberia under the commercial term "horn." The Yakut, for instance, indiscriminately designate mammoth and walrus ivory as "horn" (*muos*). To us who have a clear notion of the animals this lack of discriminating faculty may seem strange at first sight, but looking into the conditions under which the said animal products are found in Siberia we find it easy to gauge the situation. Immense deposits of mammoth and rhinoceros bones are accumulated together with masses of stranded walruses and fossil narwhal tusks along the northern littoral, and are collected promiscuously by the treasure-hunters. Walrus and narwhal as live animals are familiar solely to the maritime tribes, and totally unknown to the inland peoples. Again, the mammoth and the rhinoceros, which occur there only in fossil remains, are unknown as animals to any of them, and their bones accordingly are not distinguished. It must further be taken into consideration that in many cases it is not a complete tusk or horn which is traded by the ivory hunters, but merely fragmentary pieces; rotten and hollow portions are cut off as useless, as soon as the best-preserved pieces have been picked out, and the remainders if still of a considerable size may again be sawed into smaller portions to be rendered fit for transportation on pack-horses. The distant trader who will buy up this cargo and the consumer still more remote from the place of provenience hardly

have any means of obtaining a clear idea of the true origin of the product, still less of the character of the animal from which it may have come. The door was thus thrown widely open for fabulous speculations of all sorts in regard to the "horn." This term is encountered everywhere in Europe, among the Arabs, in China, Korea, and Japan, with reference to walrus and narwhal tusks, as the following chapter will demonstrate.

TRADE IN WALRUS AND NARWHAL IVORY

The trade in walrus and narwhal ivory is a veritable romance in the history of commerce, and it is not generally known that in times long prior to the discovery of the Arctic shores of North America and long before the two animals were described in our natural history, a lively traffic in this kind of ivory was carried on all over Asia and Europe. As this subject has never been clearly set forth in any book and is based on researches almost entirely my own, I hope that a somewhat detailed digest of the matter will be welcome. Those desirous of knowing the original sources and the exact texts of the documents may fall back on my previous studies of the subject cited in the Bibliographical References at the end; on the other hand, much new information is given here.

In the zoological system the walrus belongs to the order Pinnipedia which consists of the three families, Otariidae (eared seals), Trichecidae (walrus), and Phocidae (seals). The genus *Trichecus* (walrus) consists of two species,—*T. rosmarus* and *T. obesus*. The former occurs on the coast of Labrador northward to the Arctic Sea, along the shores of Greenland, and in the polar areas of the eastern hemisphere to western Asia. The latter inhabits the northwest coast of America, the Arctic Sea and Bering Strait, as well as the northeastern coast of Asia. The most striking

characteristic of the animal is formed by the pair of tusks corresponding to the canine teeth of other mammals; they descend almost directly downward from the upper jaw, sometimes attaining a length of twenty inches or more and a weight of from four to six pounds. The tusks do not form a solid mass throughout, but are hollow about two-thirds of their length, so that large objects and billiard-balls cannot be carved from them. The outer layer of the tooth has a dark coloration, and is not smooth as in elephants' tusks, but is fluted and hard as glass. The tips of the tusks yield a hard and solid mass which is evenly yellowish white, and in a cross-section, displays speckled designs. The lateral portions, likewise yellowish white, are crossed by fine yellow lines, or are interspersed with large, yellow, flamed spots. When exposed to the atmosphere or to moisture for a long time, the tusk will lose its whiteness and assume a yellow tobacco color.

The walrus was formerly styled "sea-horse" (Latin *Equus marinus*), its tusks "sea-horses' teeth" (e.g. John Ray, Synopsis methodica animalium quadrupedum, p. 193, London, 1693). Likewise such descriptive terms as sea-ox, sea-cow, sea-elephant were in use. In earlier literature also *morse, mors* (derived from Russian *morzh,* a word of unknown origin, through the medium of French *morse*) appears occasionally: thus William Baffin ("Relation of his Fourth Voyage for the Discoverie of the North-West Passage, performed in 1615") speaks of "peeces of the bone or horne of the sea unicorne, and divers peeces of sea mors teeth." Jonas Poole (in Purchas), in 1610, writes *mohorses,* with adaptation to *horse.*

The narwhal (*Monodon monoceros*) belongs in the zoological system to the order Cetaceae. Our word is derived from Old Norse *nahvalr,* Swedish-Danish *narhval; hvalr* or *hval* means "whale," the origin of the first element of the word is obscure. The animal

frequents the icy circumpolar seas, and is rarely seen south of 65° N. latitude. It resembles the white whale in shape and in the lack of a dorsal fin. Its peculiar characteristic lies in the absence of all teeth, save two in the upper jaw, which are arranged horizontally side by side. In the male, usually the left tooth and occasionally both teeth are strongly developed into spirally twisted, straight tusks which pass through the upper lip and project in front like horns. They frequently reach a length of about seven feet; that is, half, and even more, that of the entire animal, which in the state of maturity may attain to fifteen feet. Its life-history is but little explored, and the biological function of the tusk is conjectured rather than accurately ascertained; it is supposed to serve as a weapon of defence, for breaking ice in order to breathe, and for killing fish. The ivory yielded by the tusk, which is hollow in the interior, possesses extreme density and hardness and in this respect surpasses elephant ivory; it is of a dazzling whiteness, which does not pass into yellow, is easily wrought, and easily receives a high polish. Along the northern shores of Siberia are also accumulated fossil tusks of the narwhal together with enormous masses of mammoth and rhinoceros bones.

In the eighteenth century a narwhal was observed cast adrift at the mouth of the Elbe, and another at the estuary of the Weser. Caxton, in his Chronology of England, has an entry under the year 1482, "This yere were take four grete fisshes between Erethe and London, that one was callyd mors marine." This is the earliest instance of the occurrence of the term *morse* for the walrus in English literature.

The first acquaintance of England with the walrus, however, was much earlier and dates from the latter part of the ninth century, and is connected with the daring exploits of the Norseman Ohthere from Helgeland in Norway, who in A.D. 890 undertook

several voyages, rounded the North Cape, and reached the Kola Peninsula. He reported on this enterprise to King Alfred the Great of England (848-901), who embodied Ohthere's narrative in his Anglo-Saxon translation of Paulus Orosius' History of the World. The passage with reference to the walrus runs thus: "The principall purpose of his travelle this way, was to encrease the knowledge and discoverie of these coasts and countreyes, for the more commoditie of fishing of horse-whales, which have in their teeth bones of great price and excellencie: whereof he brought some at his return unto the king. Their skinnes are also very good to make cables for shippes, and so used. This kind of whale is much lesse in quantitie then other kindes, having not in length above seven elles. And as for the common kind of whales, the place of most and best hunting of them is in his owne countrey. Whereof some be 48 elles of length, and some 50, of which sort he affirmed that he himselfe was one of the sixe which in the space of 3 dayes killed threescore. Their principall wealth consisteth in the tribute which the Fynnes pay them, which is all in skinnes of wild beasts, feathers of birds, whale bones, and cables, and tacklings for shippes made of whales or Seales skinnes. The richest pay ordinarily 15 cases of Marternes, 5 Rane Deere skinnes, and one Beare, ten bushels of feathers, a wat of a Beares skinne, two cables threescore elles long apiece, the one made of Whales skin, the other of Seales."

The Anglo-Saxon word used in this text is *hors-hwael,* from Old Norse *hrosshvalr* ("a kind of whale") and *rosmhvalr* ("walrus").

In the sixteenth century when walrus ivory reached England from North America, it was paid for at double the rate of elephant ivory. Thomas James of Bristol, who visited the island of Ramea near Newfoundland in 1591 and who gives a description of the

walrus he encountered there, writes that its teeth were sold in England to the comb and knife-makers at eight groats and three shillings the pound weight, whereas the best ivory was sold for half the money; the grain of the bone, he remarks, is somewhat more yellow than the ivory. He also tells a curious story about his friend Alexander Woodson of Bristol, an excellent mathematician and skilful physician, who showed him one of these beasts' teeth brought from Ramea and half a yard long, and who assured him that he had made trial of it in ministering medicine to his patients, and had found it as sovereign against poison as any unicorn's horn. Gerat de Veer ("The First Navigation of William Barents, alias Bernards into the North Seas," 1594) speaks of "sea-horses being a kind of fish that keepeth in the sea, having very great teeth, which at this day are used instead of ivory or elephants teeth." Martin Frobisher (Voyage in 1577) relates, "They found a great dead fish, round like a porpoise, twelve feet long, having a horn five feet ten inches long, growing out of the snout, wreathed, and straight like a wax taper; and might be thought to be a sea-unicorn: the top of it was broken. It was reserved as a jewel by Queen Elizabeth's commandment in her wardrobe of robes, and is still at Windsor to be seen."

From the ninth century onward walrus tusks formed an important article of trade in the north-eastern part of Europe, and this was the case long before the discovery of Greenland. In Russian history they are known as "fish-teeth," as in bygone days the walrus was classified among fish everywhere in Europe and Asia. In old Russian tales are mentioned precious chairs of fish-teeth, and these fish-teeth appear as highly priced objects. At Novgorod they were traded like marten and squirrel skins and accepted as monetary values. In 1159 the grand-duke Rostislav

presented to the prince Svätoslav Olgovich sables, ermines, black foxes, polar foxes, white bears, and fish-teeth. During the period of Mongol and Tartar sway over Russia frequent demands for this product were made from Asia, and in 1476 Ivan Vasilyevich received a fish-tooth as a gift from a citizen of Novgorod.

S. von Herberstein, who, in 1549, published his work "Rerum Moscoviticarum Commentarii," a primary source for the history of Russia, and who was ambassador to the Grand Prince Vasily Ivanovich in the years 1517 and 1526, gives the following account: "The articles of merchandise which are exported from Russia into Lithuania and Turkey, are leather, skins, and the long white teeth of animals which they call *mors*, and which inhabit the northern ocean, out of which the Turks are accustomed very skilfully to make the handles of daggers; our people think they are the teeth of fish, and call them so. The ocean which lies about the mouths of the river Petchora, to the right of the mouths of the Dwina, is said to contain animals of great size. Amongst others, there is one animal of the size of an ox, which the people of the country call *mors*. It has short feet, like those of a beaver; a chest rather broad and deep compared to the rest of its body; and two tusks in the upper jaw protruding to a considerable length. The hunters pursue these animals only for the tusks, of which the Russians, the Tartars, and especially the Turks skilfully make handles for their swords and daggers, rather for ornament than for inflicting a heavier blow, as has been incorrectly stated. These tusks are sold by weight, and are described as fishes' teeth." Von Herberstein, accordingly, identifies the commercial label "fish-teeth" with the zoological term "morse"; that is, the walrus.

Richard Chancelour, in "The Book of the Great and Mighty Emperor of Russia" (1553), writes, "To

the north parte of that countrey are the places where they have their furres, as sables, marterns, greese bevers, foxes white, blacke, and redde, minkes, ermines, miniver, and harts. There are also a fishes teeth, which fish is called a *morsse*. The takers thereof dwell in a place called Postessora, which bring them upon hartes [reindeer] to Lampas to sell, and from Lampas carie them to a place called Colmogro, where the hie market is holden on Saint Nicholas day."

Farther on, he gives somewhat more detailed information on the same subject, as follows:—

"The north parts of Russia yeelde very rare and precious skinnes: and amongst the rest, those principally, which we call sables, worne about the neckes of our noble women and ladies: it hath also martins skinnes, white, blacke, and red foxe skinnes, skinnes of hares, and ermyns, and others, which they call and terme barbarously, as bevers, minxes, and minivers. The sea adjoyning, breedes a certaine beast, which they call the Mors, which seeketh his foode upon the rockes, climing up with the helpe of his teeth. The Russes use to take them, for the great vertue that is in their teeth, whereof they make as great accompt, as we doe of the elephants tooth. These commodities they carry upon deeres backes [reindeer] to the towne of Lampas: and from thence to Colmagro, and there in the winter time, are kept great faires for the sale of them. This citie of Colmagro, serves all the countrey about it with salt, and salt fish. The Russians also of the north parts, send thither oyle, which they call traine, which they make in a river called Una, although it be also made elsewhere: and here they use to boile the water of the sea, whereof they make very great store of salt."

Anthony Jenkinson, who travelled in Russia and Turkestan from 1557 to 1571, was well familiar with the life of the Russians and their use of walrus ivory.

"When he rideth on horse backe to the warres, or any iourney," he writes, "he hath a sword of the Turkish fashion, and his bowe and arrowes of the same manner. In the towne he weareth no weapon, but onely two or three paire of knives having the hafts of the tooth of a fishe, called the Morse" (E. D. Morgan, Early Voyages and Travels to Russia and Persia by A. Jenkinson, p. 40).

On his return from Persia in the autumn of 1564, Jenkinson's efforts were bent toward organizing a voyage to Cathay by the northeast passage; and in pursuance of this plan he addressed on the 25th of September, 1565, to the Queen of England a "petition relating to the north-east passage." In this memorable document he presents the following argument in which walrus teeth play a prominent part in favor of his contention that Cathay could be reached in that manner: "At my beinge in Scythia and Bactria, I divers tymes talked and conferred with dyvers Cathayens [Chinese] who wer there at that present in trade of merchanndyse towchinge the comodyties of their countrey, and how the seas aborded unto them, I learned of them that the said seas had theire course to certen northerly regions with whom they had traphyque by seas. Also havinge conferrence with th'inhabitantes of Hugarye [Ugria] and other people of Sameydes [Samoyeds] and Colmackes whose countreys lye very farr northerly (and nere whereunto I gesse the said passage to be) whiche people sayle alonge the saide coastes *fysshinge after the greate fyshe callyed the Morse* for the benefyte of his teathe. Of whome I have learned that beyonde them the sayde lande and coastes trenche and tende to the east and to the southwarde, and that the corrauntes and tydes runne east southeaste and west northweste very vehemently, whiche manifestly arguethe a passage. Further this laste yere at my beinge in th'emperoure of Muscovia his

Coorte, yt chaunced that there cam thyther certen of th'inhabitantes of the foresaid countryes to present unto the said prince a certen straunge hed with a horne therein, whiche they had fownde in the Ilonde of Vagatts [Vaigats, separated from the Siberian mainland by Yugor Shar, called Pet Straits], whiche is not farre from the river of Obbe and the mayne land of Hugarye. And for that th'emperoure neyther any of his people knewe what yt was for the straungenes thereof he commaunded that soche straungers as wer thoughte to have any judgement therin shold see the same, and be asked there opynion what they thoughte it to be. Amounge whome yt was my chaunce to be. And so was it fownde, by the reporte of them, that before had seane the lyke, to be the hedd and horne of an Unycorne, which is in no smalle pryce and estymacion with the saide prynce. Then I imagynyd with my self from whence the said hedd sholde come, and knowinge that unycornes are bredde in the landes of Cathaye, Chynaye and other the Orientall Regions, fel into consideration that the same hedd was broughte thyther by the course of the sea, and that theire muste of necessytie be a passage owt of the sayde Orientall Occean into our Septentrionall Seas, for how elles cowlde that hedd have come to that Ilonde of Vagatts."

This argument is alluded to by Martin Frobisher in his First Voyage of 1576, "That voyage was then taken in hand, of the valiant knight, with pretence to have gone eastward to the rich countrey of Cataya, and was grounded briefely upon these reasons. First, bicause there was a unicornes horne found upon the coast of Tartaria by the river Obij, which (said he) was like by no other ways to come thither, but from India or Cataya, where the saide unicornes are only found, and that by some sea bringing it thither" (R. Collinson, The Three Voyages of Martin Frobisher in

Search of a Passage to Cathaia and India by the North-West, 1576-78, p. 39).

Anthony Marsh, a factor for the Moscovie Company of England, wrote in his Notes concerning the Discovery of the River of Ob in 1584, "Not farre distant from the maine, at the mouth of Ob, there is an island, whereon resort many wilde beasts, as white beares, and the morses, and such like. And the Samoeds tell us, that in the winter season, they oftentimes finde there Morses teeth."

Giles Fletcher, who, in 1588, was sent as ambassador of Queen Elizabeth to Theodor, emperor of Russia, has the following report in his "The Russe Common Wealth," also entitled "The Native Commodities of the Contrey:"—

"Besides these (which are all good and substantiall commodities) they have divers other of smaller accompt, that are naturall and proper to that countrey: as the fish tooth (which they call Ribazuba) which is used among themselves, and the Persians and Bougharians that fetch it from thence for beads, knives, and sword hafts of noblemen and gentlemen, and for divers other uses. Some use the powder of it against poison, as the unicornes horne. The fish that weareth it is called a Morse, and is caught about Pechora. These fish teeth some of them are almost two foote of length, and weigh eleven or twelve pound apiece."

R. Stevens of Harwich ("Voyage to Cherry Island in 1608." This island, named in honor of Sir Francis Cherry, lies south of Spitsbergen) writes, "The ninth day we got one tierce of morses' teeth, besides four hundred other teeth. We brought a young living morse to court, where King James and many honourable personages beheld it with admiration. It soon died. It was of a strange docility, and very apt to be taught." In 1610 the Russia Company took possession

of Cherry Island, and that year they killed a thousand morses and made fifty tons of oil (John Harris, Voyages and Travels, 1764, Vol. II, p. 389).

In 1652, Deshneff sailed down the Anadyr as far as its mouth, and observed on the north side a sand bank, which stretched a considerable way into the sea. A sand bank of this kind is called in Siberia *korga*. Great numbers of sea-horses were found to resort to the mouth of the Anadyr. Deshneff collected several of their teeth, and thought himself amply compensated by this acquisition for the trouble of his expedition. Another expedition was made in 1654 to the Korga, for the purpose of collecting sea-horse teeth. A Cossack, named Yusko Soliverstoff, was one of the party. This person was sent from Yakutsk to collect sea-horse teeth for the benefit of the crown (W. Coxe, Account of the Russian Discoveries between Asia and America, pp. 318, 319, London, 1780).

An important contribution to the subject is furnished by the Jesuit father Avril, who in the latter part of the seventeenth century gathered the following information from the Russians: "Besides furs of all sorts, which they fetch from all quarters, they have discovered a sort of ivory, which is whiter and smoother than that which comes from the Indies. Not that they have any elephants that furnish them with this commodity (for the northern countries are too cold for those sort of creatures that naturally love heat), but other amphibious animals, which they call by the name of *Behemot*, which are usually found in the River Lena, or upon the shores of the Tartarian Sea. Several teeth of this monster were shewn us at Moskow, which were ten inches long, and two at the diameter at the root: nor are the elephant's teeth comparable to them, either for beauty or whiteness, besides that they have a peculiar property to stanch blood, being carried about a person subject to bleeding.

The Persians and Turks who buy them up put a high value upon them, and prefer a scimitar or a dagger haft of this precious ivory before a handle of massy gold or silver. But certainly nobody better understands the price of this ivory than they who first brought it into request; considering how they venture their lives in attacking the creature that produces it, which is as big and as dangerous as a crocodile." Farther on, Avril quotes a story told him by the Voyevoda of Smolensk about an island at the mouth of the great River Kawoina, beyond the Obi, that discharges itself into the Frozen Sea. "This island is spacious and very well peopled, and is no less considerable for hunting the *Behemot,* an amphibious animal, whose teeth are in great esteem. The inhabitants go frequently upon the side of the Frozen Sea to hunt this monster; and because it requires great labor and assiduity, they carry their families usually along with them." Avril, accordingly, confirms the fact that the Russians hunted the walrus along the shores of the Arctic Sea, and that the animal's tusks were conveyed to Moscow and traded to the Persians and Turks.

The Arabs, as we learn from al-Beruni (A.D. 973-1048) in a treatise on precious stones written by him, prized walrus ivory highly and called it *khutu.* They received it from the Bulgars, who then resided on the Volga and who brought from the northern sea "teeth of a fish over a cubit long," which were wrought into knife-hilts. The Arabs traded them even to Mekka. The Egyptians craved them and purchased them at a price equal to two hundred times their value. Maqdisi or Muqaddasi (about A.D. 985) mentions fish-teeth among the exports from Bulgar into Kharizm (Khiva). The Jesuit Avril, as quoted above, observes that the Persians and Turks bought up walrus teeth at a high value and preferred a scimitar or a dagger haft of this precious ivory to a handle of massive gold or

silver. The Persians adopted both the foreign term *khutu* and the designation "fish-tooth" (*dandān māhī*, also *shīr māhī*, "lion-fish"), and turned combs and knife-hilts out of it, which were transmitted to India. In the second volume of his Memoirs, the emperor Jahangir tells how delighted he was when he received from Persia a dagger whose hilt was made of a fish-tooth. He was so much impressed by this hilt that he despatched skilful men to search for other specimens in Persia and Transoxania. Their instructions were to bring fish-teeth from anywhere, and from any person, and at any cost. A little later a fine specimen was picked up in the bazar of his own capital of Agra, and was brought to him by his son, Shah Jahan. Jahangir had the tooth made into dagger-hilts, and gave one of the craftsmen an elephant as a reward, and bestowed on the other increase of pay and a jewelled bracelet. The idea that this ivory was believed to be an antidote to poison, and also to reduce swellings, added greatly to its value. From a statement in the history of Akbar the Great, known as the Akbarnāma, it appears that about 1569 a Raja in Malabar, who probably was the Raja of Cochin, sent Akbar a knife which had the property of reducing or removing swellings, and that Akbar told his secretary that it had been successfully applied in more than two hundred cases. Probably this knife was made, wholly or in part, of walrus ivory, which could easily have been brought to Cochin by sea.

At present India still has a kind of ivory known as "fish-tooth" (*mahlīka-dant*). This is always of a dirty (oily) yellow color with the texture looking as if crystallized into patches, which is characteristic of the interior of the walrus tusk. The significance of being called in every language and dialect of India "fish-tooth" at once suggests a common and, most probably, foreign origin for the material. An inquiry made by

George Watt disclosed the fact that it was more highly valued for sword and dagger hafts and more extensively used for these purposes than is ivory. It is put through an elaborate and protracted process of curing before being worked up. The crude fish-tooth is wrapped up in a certain mixture and retained in that condition for various periods, the finer samples for as long as fifty years. The advantages are its greater strength, finer and smoother surface, and greater resistance (less liability to slip in the hand) than is the case with ivory. According to Watt, the fish-tooth of Indian trade is mainly, if not entirely, the so-called fossil ivory of Siberia—the ivory of the mammoth; but he thinks it equally possible that a fair amount of walrus ivory finds its way into India by passing, like the Siberian ivory, over land routes to India. And from the antiquity of some of the swords, found in the armories of the princes of India with "fish-tooth" hafts, it would seem possible that there has existed for centuries a traffic in carrying this material to India.

A Turkish work on mineralogy, written in A.D. 1511-12 by Ibn Muhammad al Gaffari, contains the following account: "On the Khutu Tooth. The *khutu* is an animal like an ox which occurs among the Berber and is found also in Turkestan. A gem is obtained from it; some say it is its tooth, others, it is its horn. The color is yellow, and the yellow inclines toward red, and designs are displayed in it as in damaskeening. When the khutu is young, its tooth is good, fresh, and firm; when it has grown older, its tooth also is dark-colored and soft. The padishahs purchase it at a high rate. Likewise in China, in the Magrib, and in other countries it is known and famous. It is told that a merchant from Egypt brought to Mekka a piece and a half of this tooth and sold it on the market of Mina for a thousand gold pieces. Poison has no effect upon

one who carries this tooth with him, and poison placed near it will cause it to exude. For this reason it is highly esteemed."

Pierre Belon (1518-64), a prominent French traveller and naturalist, wrote in 1553, "The Turks have this custom in common with the Greeks that they carry their knives suspended from their belts. These knives are commonly made in Hungary with very long handles; but when the merchants of Turkey buy them, they turn them over to artisans to add to them a butt which is commonly made of Rohart tooth [walrus tooth]. There are two sorts: one is straight white and compact, resembling the tooth of the unicorn [narwhal], and is so hard that steel will hardly affect it unless it be well tempered. The other tooth of Rohart is curved like that of a boar: we might have believed that it was the tooth of a hippopotamus, had we not observed this animal alive which had no such teeth." The French word *rohart* (also *rohar, rohal*) refers to the walrus, and is connected with Old Norse *horshvalr* (Norwegian *rohal, roshal*). In the Latin translation of Belon's work prepared by the botanist C. Clusius (1589) the name "morse" for the animal has been added.

In the beginning of the seventeenth century, the Company of the Greenland Merchants of England shipped to Constantinople a "horn," as it was then called, found by an English sea-captain in 1611 in the ground on the coast of Greenland, and the sum of two thousand pounds sterling was offered for it. The Company, however, in the hope of a better price, declined to sell and sent it on into Muscovy, where approximately the same price was bidden. Hence the tooth was transported back into Turkey, where a much smaller sum was then proffered than before. The Company therefore decided that the tooth would sell more easily in pieces than entire, and had it broken up.

The single pieces were finally disposed of in different places, but the proceeds amounted to only twelve hundred pounds sterling (account of Pietro della Valle in 1623; the complete text is given in "Sino-Iranica," p. 567).

Quite independently of Europe, the Chinese received walrus ivory from the northeast of Asia through the medium of numerous tribes settled in this region. Beyond the boundaries of Korea, in the east conterminous with the ocean, the northern limit being unknown, there was from remote ages the habitat of the Su-shen, who have greatly stirred the imagination of Chinese and Japanese chroniclers, and who are frequently mentioned in the Chinese Annals. They were the Vikings of the East, raiding on several occasions the coasts of northern Japan and engaging in many a sea-battle with the Japanese in the seventh century. For a thousand years earlier, the Chinese were acquainted with this nation and its peculiar culture. They used flint arrowheads, usually poisoned, which were preserved as curiosities in the royal treasury of China. They lived through a stone age for at least fifteen hundred years down to the middle ages when they were merged in the flood of roaming Tungusian tribes. They availed themselves of stone axes which played a role in their religious worship, and of hide and bone armor for defence. In A.D. 262 they sent to China a tribute consisting of thirty bows, wooden arrows, three hundred stone crossbows, twenty suits of armor made of leather, bone, and iron, respectively, as well as a hundred sable-skins. This enumeration of objects brings us into close contact with the state of culture that partially still prevails in the northern area of the Pacific, and the main representatives of which at the present time are the Koryak, the Chukchi, and the Eskimo. In this area still occurs that peculiar type of bone plate armor composed of rows of over-

lapping ivory plates, and the plates in this type of armor are commonly carved from walrus ivory, possessing as it does a higher degree of elasticity than any ordinary kind of bone. The Su-shen, accordingly, appear to have been in possession of walrus ivory, at least prior to A.D. 262, and probably wrought it themselves into plates for armor.

A product of the nature of walrus ivory first became known in China during the reign of the T'ang dynasty (A.D. 618-906) under the name *ku-tu kio* ("horn of the *ku-tu*," the latter being a non-Chinese word derived from some native tribe of northeastern Asia). *Ku-tu* is given in the T'ang Annals among the taxes sent from Ying-chou in Liao-tung, and this was the domicile of the Kitan and other Tungusian tribes. It is also mentioned as a product of the Mo-ho, likewise a Tungusian tribe, whose country abounded in sables, white hares, and white falcons. The Mo-ho were settled to the north of Korea and extended east of the Sungari River as far as the ocean. They lived in close proximity and intercourse with the Liu-kwei, a people briefly described in the Annals of the T'ang Dynasty. The geographical position of the country of the Liu-kwei is clearly enough defined to lead us to Kamchatka. The culture of this people, as characterized by the Chinese, plainly reveals a type that is still found in the North-Pacific area. These cultural traits are, absence of agriculture, economy essentially based on the maintenance of numerous dogs, subterranean habitations, utilization of furs as winter costume, employment of fish-skins as clothing in the summer, and transportation on snow-shoes. The Mo-ho entertained a lucrative commerce with the Liu-kwei by way of the sea, the voyage lasting fifteen days; and when the latter in A.D. 640 sent a mission to China, their envoys travelled across the Mo-ho country. One of the three interpreters with whom they arrived at the Chinese

Court appears to have been a Mo-ho, and the extract in the Annals is doubtless based upon a report made by the Mo-ho. The latter, accordingly, were in intimate contact with a people that had the walrus and its product within easy reach; and from the descriptions of Steller and Krasheninnikov, which represent the principal sources for our knowledge of the ancient Kamchadal or Itelmen who are now almost extinct, we know surely enough that these tribes hunted the walrus and utilized its ivory for industrial work.

Hung Hao (A.D. 1090-1155) was sent as an ambassador of the Sung to the court of the Kin dynasty which belonged to the Jurchi or Niüchi, a tribe of Tungusian origin. He remained there for fifteen years (1129-43), and in his memoirs (*Sung mo ki wen*) has this note: "The *ku-tu* horn is not very large. It is veined like ivory, and is yellow in color. It is made into sword-hilts, and is a priceless jewel." In the History of the Liao or Kitan Dynasty (*Liao shi*, chap. 116), which ruled from A.D. 907 to 1125, the word *ku-tu-si* is defined as "the horn of a thousand years' old snake," the word *tu-na-si* being added as a synonym. These evidently are words belonging to the native language of the Kitan, although the Kitan on their part may have derived them from peoples living farther to the north. In the Annals of the Kin Dynasty (*Kin shi*, chap. 64) are mentioned daggers with hilt of *ku-tu-si* of the ancient Liao. Hung Hao also wrote in 1143 or shortly afterwards, "The Kitan hold the *ku-tu-si* in esteem. The horn is not large, but it is so rare that among numerous pieces of rhinoceros-horn there is not a single *ku-tu-si*. Unlike rhinoceros-horn, the latter has never been wrought into girdles. It has designs like those in elephant ivory, and is yellow in color. Only knife-hilts are made from it, and these are considered as priceless. The emperor T'ien Tsu (reigned A.D. 1101-19, died in 1125) had a girdle-

pendant (*t'u-hu*) made from this substance." This was an exceptional case, for the girdles of the Kin dynasty were made of jade, gold, rhinoceros-horn, ivory, bone, and horn, and were graded in the order of these materials. This point bears out the fact that *ku-tu-si* represents a category of its own, and can have been neither elephant ivory nor rhinoceros-horn, which were the common articles for the girdles of the Kin or Jurchi. Moreover we know the Jurchi terms for elephant ivory and rhinoceros-horn, and these are distinct from *ku-tu-si*, which refers to walrus ivory.

Chou Mi (A.D. 1230-1320), a celebrated and prolific writer of the Sung period, alludes to *ku-tu* in two of his works. In one of these he cites the opinion of Sien-yü Ch'u, a poet and caligrapher, who possessed two knife-hilts made of this substance, to the effect that "*ku-tu* is a horn of the earth," which may possibly mean a horn found in the ground or underground. This might be construed to allude to mammoth tusks, although the evidence is not conclusive in view of the fact that walrus and narwhal tusks are likewise found in and under the ground along seashores. In another book Chou Mi writes that "*ku-tu-si* is the horn of a large snake and that, being poisonous by nature, it is capable of counteracting all poisons, as poison is treated with poison." This poison-curing property is a notion transferred to *ku-tu* from the ancient beliefs in the efficacy of rhinoceros-horn. The Chinese fondly entertained the idea that the rhinoceros feeding on brambles swallows all sorts of vegetable poisons which penetrate into its horn, so that in accordance with the principle that poison can neutralize poison, the horn or a cup carved from it becomes an efficient antidote. In 1320, Pi-ming, a son of Sien-yü Ch'u, was still the owner of the objects of which his father had spoken to Chou Mi thirty years earlier, and Ye Sen who saw them in his possession

wrote an additional note on the subject which is embodied in Chou Mi's work. He observes that the natural designs displayed in the two knife-hilts of *ku-tu-si* resembled the sugar-cakes then sold in the markets; there also were white spots somewhat like those on candied cakes and pastry. "When touching this substance with your hands," he concludes, "it emits an odor like that of cinnamon; when after rubbing it no odor is perceptible, it is a counterfeit." Walrus ivory, on being rubbed, indeed emits a certain odor. Ye Sen's remark shows that the fakers were no less busy in China six hundred years ago than at present and that then also certain sleights were performed to test the genuineness of an article.

During the Mongol period the Chinese learned the fact that walrus ivory was found among the products of the western countries. In A.D. 1259 Chang Te was dispatched by the Mongol emperor Mangu as an envoy to his brother Hulagu, king of Persia. On his return to China he published a diary of his journey in which he mentions, among the products of the west, *ku-tu-si* as the horn of a large snake which has the property of neutralizing every poison. It is an interesting coincidence that the Kitan-Chinese term *ku-tu* has migrated westward and that for the first time it makes its appearance in a mineralogical treatise of the great Arabic traveller and scholar, al-Beruni (A.D. 973-1048); subsequently it recurs frequently in Arabic, Turkish, and Persian authors. Al-Beruni writes that *khutu* is much in demand, and is preserved in the treasuries of the Chinese who assert that it is a desirable article because the approach of poison causes it to exude, and that it was wrought into knife-hilts.

In the age of the Mongols we receive an interesting bit of folk-lore which has been recorded by Haithon, king of Armenia (1224-69), in the narrative of his journey to the Mongols written by Kirakos of

Gandsak. Haithon relates the universal legend of the country of the dog-heads, where the men have the shape of dogs, but the women have the human form and are endowed with reason. These fabulous creatures were located by the Chinese in an island of the northern Pacific, and Haithon adds, "There is also a sandy island there where is found a precious bone in the form of a tree, called fish-tooth; when it is cut, another bone will shoot forth at the same spot, in the manner of deer's antlers." The question is here of walrus tusks: the tusk was regarded as a "horn" (cf. p. 36); and in the same manner as the stag sheds its antlers, so also the "horns" of the marine mammals were believed to become detached and to grow again.

Toward the latter part of the seventeenth century, when the Russians established commercial relations with China, they traded chiefly two articles—seal-skins and walrus tusks, the latter being styled in the Russian documents of the time "bones of walrus tooth." A contemporaneous Chinese book (the *Pa hung yi shi* written by Lu Ts'e-yün in 1683) contains a brief description of Russia under the name A-lu-su (based on the Mongol name of Russia, Oros) and mentions the fact that in the reign of K'ang-hi (1662-1722) the Russians presented fish-teeth, black sables, gyrfalcons, a striking clock, glass mirrors, and other objects. It is perfectly obvious that the "fish-teeth" of this text, as corroborated by the coeval Russian documents, represent walrus tusks.

Gerbillon, one of the old Jesuit missionaries working in Peking (in Du Halde, Description of the Empire of China, Vol. II, p. 263, 1741), speaking of the trade of the Russians, mentions "the teeth of a sort of fish, which are much finer, whiter, and more precious than ivory. With these they drive a great trade to Peking, though scarcely any people but the Russians, who are poor, and inured to cold and fatigue, would take so

much pains for so little profit." In a footnote it is added, "They are those called Mamuts teeth, found lately to be the teeth of elephants." But as already remarked by J. Rankin (p. 454), this is an addition of the translator, and the term "fish-teeth" used by Gerbillon, as well as the emphasis laid on the white color, demonstrates plainly that the question is of walrus tusks.

Since the beginning of the eighteenth century, in the era of K'ang-hi, the Chinese have gradually become acquainted with the walrus. In the dictionary *Cheng tse t'ung* it is designated "sea-horse" (*hai ma*), defined as "a fish or seal with teeth as strong and bright as bone and adorned with designs as fine as silk,—workable into implements." A curious description of the animal is also given in the *Hai lu* ("Records of the Ocean"), a small book published in 1800 by Yang Ping-nan and containing accounts of foreign nations from information received through a friend who had spent fifteen years voyaging to different parts of the world.

Besides the Russians, the Gilyak also, who are settled at the mouth of the Amur and on the island of Saghalin, traded walrus ivory to the Chinese on the Sungari. The Gilyak, on their part, received the Arctic product through the medium of the northern adjoining tribes in times prior to the Russian colonization of the Amur territory; the animal itself is known to the Gilyak solely by name. From 1853 they purchased its tusks from the Russian-American Company of Nikolayevsk and bartered them with the Chinese of the Sungari in a profitable trade for other articles. Vladivostok, prior to the war at least, received a share of walrus ivory from Gishiginsk and Baron Korff's Bay, a region inhabited by the Koryak. The Chukchi in the farthest corner of northeastern Asia, are great

walrus-hunters, and formerly carried on an enormous trade in the tusks.

In the K'ien-lung period (1736-95) walrus ivory was carved into snuff-bottles, dishes, stems for tobacco-pipes, and covers for cricket-gourds. As a rule, the material was stained a bright green by means of verdigris to lend it the appearance of jade; but it must not be inferred from this that any ivory thus treated is that of the walrus and that ivory kept in its natural colors is necessarily that of the elephant. The hand of the back-scratcher shown in the case, for instance, is white, but of walrus ivory.

Finally, America came to the fore in the exportation of this article. It was during the nineteenth century that walrus ivory under the name *hai-ma ya* ("sea-horse teeth"), by which it is still commonly known in Canton, was imported into that city in large quantity from California, Sitka, and other parts of western America. The first American ship that reached China was the "Empress of China" which arrived at Canton in 1784, mainly with a cargo of ginseng. A company in Boston sent in 1788 two ships to the Northwest Coast, the "Columbia" and the "Lady Washington," which spent the spring and the summer of the following year in trading along the coast. At the close of the season all the furs collected were put on board the "Columbia," which then proceeded to Canton to dispose of the peltry, and with a cargo of Chinese goods returned to Boston by way of the Cape of Good Hope, arriving in August 1790 as the first American vessel which had circumnavigated the globe. The following years show a considerable growth in the American Northwest Coast trade, until in 1801 there were at least fourteen American ships on the coast. The normal voyage was to sail from the United States in the summer or early autumn, and to arrive on the North-

west Coast in the spring. The captains would then trade with the Indians from inlet to inlet, getting skins, preferably those of the rare sea-otter, in exchange for trinkets, knives, firearms, blankets, cotton and woollen cloths. In the autumn they would cross the Pacific to Canton, or if they had not yet obtained a cargo, they would winter at the Hawaiian Islands and trade on the Coast a second and even a third season before going to China. Once there they would exchange their cargo for tea and other goods and return to the United States by way of the Cape of Good Hope. The voyages, as a rule, were very lucrative. The original outlay was small, the furs sold in Canton at a large gain, and the teas and other goods purchased with the proceeds brought another profit in America or Europe. The voyages, however, were full of risk and required experience, and the trade was in the hands of a few large firms (cf. K. S. Latourette, History of Early Relations between the United States and China 1784-1844, Yale University Press; 1917). The beginnings of the trade in walrus ivory may be traceable to these early cruises.

In 1913 the Department of Commerce and Labor in Washington published the following communication from F. D. Cheshire, American Consul-General at Canton: "Before the revolution, about eighteen months ago, there was considerable trade in the manufacture from walrus ivory tusks of tobacco-pipe mouth-pieces, handles of fans, thumb-rings, and peacock-feather tubes for mandarin hats. These articles were sent to Peking, where they were dyed a green color, resembling the color of jade, but since the revolution there has been very little activity in the manufacture of such goods from walrus tusks. The demand has fallen off considerably, and the trade is confined to making cigarette holders, tooth-brushes, and chopsticks. The value of walrus tusks is $280 to $400 Hongkong cur-

rency per picul (133⅓ pounds). Elephant tusks are worth $700 to $1,200 Hongkong currency per picul. The elephant tusks are more serviceable and at the same time more valuable."

At the same time, Consul-General G. E. Anderson of Hongkong reported to the Department that inquiry among local importing and exporting firms and dealers in ivory of Hongkong failed to locate any importations of walrus ivory, but that elephant ivory was imported in large quantities, and was shipped mostly to Canton.

According to a communication of the United States Collector of Customs at the port of Juneau, Alaska, there was during the year 1913 exported direct from Alaska to China 4,000 lbs. of walrus ivory, to the value of $1,200, and from Alaska to the United States 7,763 lbs. of foreign walrus ivory, to the value of $2,717. The destination of the latter quantity was unknown to the office at Juneau, but it was believed there that the bulk of this ivory found its way to Japan and China. The shipment of ivory to China was made in that year by the Norwegian tramp steamer "Kit" from Nome en route to Japan; there is no regular transportation line direct from the Alaskan coast to the Orient, but occasionally tramp steamers call at different ports, bound for the Orient.

During the year 1924 there were shipped from Alaska to the United States 4,854 pounds of ivory valued at $6,602. This includes ivory of all kinds, but it is mostly walrus ivory (communication of the U. S. Collector of Customs at Juneau, January 19, 1925).

During my stay in China in 1923 I made inquiries among the ivory carvers of both Peking and Shanghai. They were perfectly well acquainted with walrus ivory and knew that the tusks, specimens of which were kept in their shops and readily shown me, came from America. In Shanghai the old term

"fish-tooth" (*yü ya*) is still in use; both in Shanghai and Peking a new term has also sprung into existence —*ts'iu kio* ("horn of the *ts'iu*," originally the designation of some giant fish and the loach).

The Japanese likewise utilized (and still utilize) both walrus and narwhal ivory (besides elephant ivory) for their *netsuke* and other carvings. At the end of the eighteenth century shipwrecked Japanese sailors cast adrift on the Aleutian Islands acquainted their countrymen with the walrus by means of a somewhat grotesque, but unmistakable sketch. It happens that walrus sometimes get astray into the waters of Japan, and about 1890 one was caught near Hakodate in Tsugaru Strait, which must have passed along the Kurils from the north. The walrus is called in Japanese *kaiba* ("sea-horse"); its teeth, *kaiba no kiba*. It is curious that formerly also the term *unikōro* (our "unicorn") was used and written with two Chinese characters which mean "single horn." This hints at a trade in the product with Portuguese and Hollanders. Under the foreign name mentioned a pair of walrus tusks is figured in the Japanese cyclopædia *Wa-kan san-zai-zu-e*, first published in 1714, with the explanation that such tusks were imported on Dutch ships coming from Batavia; they were 6-7 feet in length and measured 3-4 inches in circumference, resembling elephant ivory. Among the temple treasures of Nikko, a narwhal tooth is still preserved in the temple of Iyemitsu. The rectangular box in which it is kept is inscribed with the words "a horn of the Barbarians" (*Ban-kaku isshi*). This tusk is said to have been presented by the Hollanders in 1671. According to Thunberg whose travels extended over the years 1770 to 1779, narwhal ivory was contraband in Japan before his time, and the Hollanders reaped immense profits by it, as the Japanese, who attributed to it all medicinal virtues, were willing to pay exorbitant prices for it.

IVORY SUBSTITUTES

Substitutes for ivory have been plentiful, both in ancient and modern times. The ancients used the teeth of the hippopotamus ("river horse") of the Nile like ivory: thus Pausanias mentions a golden statue of Demeter whose face was formed of hippopotamus teeth. The animal was known to the Hebrews under the name *behemoth* (Job, XL, 10), which is derived from the Egyptian *p-ehe-mau* ("water-ox"). We have seen that Avril availed himself of this Hebrew word for the designation of the walrus, and it has even been suggested that the word *mammoth* has been derived from *behemoth* through the medium of an Arabic form *mehemoth*. It is by no means certain, however, that this etymology is correct. The word *behemoth* was used rather flexibly, and was referred not only to the mammoth, but also to any large and strange beast, for instance, to the rhinoceros. Hekataeus, one of Herodotus' authorities, is the first who gave a description of the hippopotamus. The animal was hunted by means of harpoons, and large numbers were captured alive to be sent to Rome for the purpose of fighting in the circus with crocodiles. Both skin and teeth were used for industrial work. Arabic authors like Masudi and Damiri refer to the animal; and, in his notes on Egypt, Chao Ju-kwa, a Chinese author, who wrote in A.D. 1225, mentions water-horses in the Nile, which come out of the river to feed on the herbs growing on the banks, but which dive into the water at the sight of a man. Kubilai, the Great Khan, as Marco Polo relates, received from envoys he had sent to Africa "two boars' tusks, which weighed more than fourteen pounds apiece; and you may gather how big the boar must have been that had teeth like that! They related indeed that there were some of those boars as big as a great buffalo." These boar's teeth, as Yule comments in his edition of Marco Polo, were indubi-

tably hippopotamus teeth, which form a considerable article of export from Zanzibar. Burton speaks of their reaching twelve pounds in weight.

Francesco Carletti, who travelled in America and in the Far East from 1594 to 1606 and whose very interesting book in Italian, entitled "Ragionamenti," was published at Florence in 1701, discusses the Mohammedan trade at Goa and mentions the importation of sea-horse teeth (*il dente del cavallo marino*), which he identifies with the hippopotamus. He further mentions another tooth, no less marvelous and of no less virtue coming from a fish called Fish Woman (*Pesce Donna*), so called from the resemblance it bears to a human creature. It is said that this fish has solely one tooth of marvelous virtue for stopping the flow of blood; yet of all these teeth they make without distinction crowns and rings, as likewise of the tooth of the hippopotamus to which they attribute the same virtue, but it is not so highly esteemed. This "fish" is the dugong (*Halicore dugong*), a cetaceous animal found in all parts of the Indian Ocean. Pliny and Aelian have written about it; according to the latter, these creatures partly resemble satyrs, partly human women. The Chinese also have their share of fables about this creature, believing that in the course of many years its teeth change into dragon's teeth, and in this state they call the animal "pig-woman-dragon." Its teeth were formerly imported into China from the southern seas to be made into knife-hilts and handles for fans. They were even imitated with elephant ivory which was subjected to an artificial treatment by means of chemicals.

At the first quarterly ivory sale held at Antwerp in 1912, 71 hippopotamus tusks were sold, at the second quarterly sale 262 hippopotamus tusks, and at the third quarterly sale 97 tusks. At one of these sales held in

1911, twelve kilos of rhinoceros tusks are mentioned, so that also these must serve as a substitute of ivory.

Bones of whale, crocodile, and large sea-fishes also are said to be used in lieu of ivory, particularly in Annam, where the material is exposed to the smoke of a charcoal fire; it is then gently rubbed in the sunlight, and is finally rolled for twenty-four hours in fresh tobacco-leaves of *Nicotiana rustica*. An ultimate energetic massage will produce a certain ivory-like appearance and a yellow tint which is not unpleasing. Similar bones are utilized in China for cheap ornaments, but they are invariably dyed a pink color and sold under the name "fish-bone" (*yü ku*), not as ivory. Teeth of the sperm-whale, lamantin, and other phocine animals are imported into China in limited quantities, and are also used like ivory.

In Japan, the large canine teeth of the sea-lion, some of which are nearly four inches in length and of the consistency of ivory, are sometimes carved into *netsuke*. In the same manner the Koryak of northeastern Siberia employ the teeth of the white whale and the bear in carvings.

Finally we have also blessed the Chinese with celluloid which they euphemistically call "European ivory."

OBJECTS MADE OF IVORY

From the preceding discussion it becomes clear that the Chinese, in the course of their history, have utilized the ivory of the elephant, the mammoth, the walrus and the narwhal. In specimens of the archaic period, as illustrated in Plate I, we may not err in tracing the ivory to the native elephants of ancient China. From the period which marks the end of antiquity down to the middle ages (that is, from the Han to the close of the T'ang dynasty, 206 B.C.—A.D. 906) we are bound to assume that the bulk of ivory

used by the Chinese came from Kwang-tung and Yünnan, Annam, Camboja, Siam, Burma, and India. From the tenth century onward the chief importers of ivory into China were the Arabs, who obtained the material from Java, Sumatra, India, and the east coast of Africa. At present it is chiefly imported from Siam, India, and Africa, and the African ivory will presumably preponderate. The export of ivory from Siam for the fiscal year ending March 31, 1910, amounted to 4,301 pounds, valued at $8,489, and this is regarded as a fair average of the export for the preceding five years; this ivory is obtained from domestic elephants that have died a natural death, as the animal is not hunted in Siam for its ivory; the number of tame elephants kept in Siam is roughly estimated at about three thousand. From Bombay also much ivory is at present exported to China.

To what extent mammoth ivory was utilized in China is a question difficult to answer. It is said that the furniture-makers of Ning-po used it for inlaying tables. The desk-ornament illustrated in Plate IX, Fig. 3, is possibly a piece of mammoth ivory; it is deep brown and yellow in color, and is left in its natural state, being only sawed off and polished along the base. The Chinese collector from whom I obtained this object in 1923 was unable to give any information about it.

The articles most commonly made of walrus ivory are combs and back-scratchers both of which are kept intact in their natural colors, handles for fans (see exhibition of fans in Blackstone Chinese Collection), dice for gambling, ear-rings and other small ornaments usually dyed green with verdigris, and, above all, chopsticks. It is a curious fact that, although the wholesale price of raw walrus ivory is lower than that of elephant ivory, chopsticks of the former material are higher priced in Peking than those of the latter. A

pair of good elephant-ivory chopsticks may be bought anywhere at a price of Chinese $1.80-2.00, while a pair of green walrus-ivory chopsticks, like that placed on exhibition, which is a perfect specimen, retails in Peking at Chinese $12.00, and a pair but partially green at Chinese $5.50. Chopsticks are a remarkable Chinese invention, and, as stated, were used as early as the Chou period; in the sculptured bas-reliefs of the Han period many banquets are illustrated with chopsticks in evidence. While all other nations took their food with their fingers, the Chinese were the first who introduced and practised good table-manners.

The small dish illustrated in Plate IX, Fig. 1, is likewise of walrus ivory stained green and carved all over into a swirl of waves rising into crests along the edge. The two covers for cricket-gourds in Figs. 4 and 5 of the same Plate are made of the same substance. One shows a boat in which a lady with a basket stands, speaking to a man seated in a mat-covered cabin. The other is carved in two layers, the upper one in green representing a bird on the wing flying toward a blossoming plum-branch (see, further, below, p. 74).

Archaic objects of ivory are figured in Plate I and have been referred to on p. 9. As to the T'ang period (A.D. 618-906), the Japanese Treasure-house of Nara furnishes us some good examples, as, for instance, a backgammon board of sandalwood decorated with ivory inlays (*Tōyei Shukō*, pl. 72), and two standard foot-measures of ivory colored red and green, respectively (pl. 82-83). As Omura Seigai informs us, ivory at that time (eighth century) was colored crimson, indigo, green, or some other shade, and on this colored surface floral designs were so engraved that the unstained part of the ivory stood out. He states that this process has altogether been lost, and was not used in later times. This may hold good for Japan,

but in China it survived at least down to the K'ien-lung period from which we have ivory snuff-bottles with paintings of the same technique. The fact that ivory was painted in China under the T'ang may be gleaned from an ivory fragment found by Sir Aurel Stein (Serindia, p. 779) in the Limes of Tun-hwang; it bears traces of a painted leaf-scroll in green. Ivory dyed by means of purple in Asia Minor was known in the Homeric age (*Iliad*, IV, 141). The Hawaiians colored whale ivory yellow by smoking it with green banana leaves.

Under the Mongols who ruled China as the Yüan dynasty (A.D. 1260-1367), a bureau for carvings in ivory and rhinoceros-horn was established. In this court-atelier couches, tables, implements, and girdle-ornaments inlaid with ivory and horn were turned out for the imperial household. An official was placed in charge of it in 1263, and the force consisted of a hundred and fifty workmen. Again, toward the end of the seventeenth century, under the reign of K'ang-hi, an atelier for ivory works was founded within the palace at Peking in connection with twenty-six other establishments for the practise of all industrial arts. Experienced craftsmen for the various branches of work were summoned to Peking from all parts of the empire. These factories lasted somewhat more than a century, and were closed after the reign of K'ien-lung (1795). Authentic productions which could be safely identified with the output of the Mongol imperial works have not yet come to light; but there are authentic specimens of the K'ien-lung period, which have come from the imperial palace and without any doubt were fabricated in the imperial atelier, as, for instance, the fan illustrated in Plate VIII. This is a marvel of technical skill and harmonious beauty, being plaited from finely cut ivory threads held by a tortoise-shell rim and overlaid with colored ivory carvings of

lilies, peonies, asters, and a butterfly. The handle, likewise of ivory, bears etched designs in colors of flowers and butterflies. The carved medallion on the dividing rod in the centre is of amber, and the ornament above the handle is of brass inlaid with blue kingfisher feathers. At the time of the Han, Wei and Tsin periods (first to fifth century A.D.), as we read in Chinese accounts, mats of ivory were made. The ivory plaiting in the above fan may give us a clew to the technique of such mats. John Barrow, who visited China in 1792, speaks of neat baskets and hats made at Canton from ivory shavings interwoven with pieces of quills, and as light and pliant as baskets and hats of straw.

Paléologue (L'Art chinois) said in 1887 that the fine Chinese ivories are excessively rare, and that the Buddhistic statuettes offer us the most interesting specimens of sculptured ivory. Unfortunately such statuettes never bear the signature or seal of the artist, nor are names of ivory-carvers preserved to us in any records, so that we are entirely ignorant of art-schools and artists working in this field.

The goddess of compassion, Kwan Yin, has been the most favored subject of the sculptors, who were particularly tempted by the task of presenting the drapery of her long, flowing garb in graceful sweeps and elegant lines. The statuette (Plate II, Fig. 1) representing her is a masterpiece of modeling animated by life and motion, and is a triumph of the spirit over matter. Her left hand supports a bowl believed to be filled with the nectar of immortality, and her right hand touches a ladle inserted in the bowl, ready to distribute her gifts among her devotees. Bracelets adorn both her wrists. Her face is refined and spiritual and astir with religious fervor. The lines of the figure and the drapery of the robe are exquisite, worthy of a Madonna. No less impressive

is the statuette of Tung-fang So (Plate II, Fig. 2) whom we met as author of a book of marvels (p. 24). He lived in the second century B.C. as a poet, statesman, and adept versed in the mysteries of Taoism. He was reputed as being possessed of divine wisdom and supernatural powers, and is said to have thrice abstracted from paradise the famed peaches of immortality which ripen but once in three years. He was on intimate terms with the emperor Wu, amusing him with humorous sallies and earning for himself the sobriquet of the Wit. Our figure shows him as a genial old man with long whiskers and deep furrows over his eyes; he handles a palm-leaf fan in his right hand. The carving of the figure is cleverly adapted to the natural curve of the elephant tusk. Both these statuettes may be confidently ascribed to the Ming period (1368-1643). Both have developed fine patinas of dark brown and deep yellow.

A somewhat different style is represented in the statuette of a Buddhist monk of pure-white ivory (Plate III), apparently a portrait modelled from life in the era of K'ang-hi (1662-1722). He is obviously shown in the act of preaching a sermon of Buddha's gospel based on the text that is written on the roll of paper which he grasps in his left hand. Baldheaded, as the Buddhist monks are, with bright, intelligent eyes (outlined in black), high forehead, and his lips in motion, he stands there a worthy disciple of Çakyamuni, humble and modest, sincere and fully conscious of the truth of his convictions.

The Arhats (in Chinese Lo-han), the celebrated disciples of the Buddha, form the subjects of the ivory figures in Plates IV and V. The two grouped in Plate IV were evidently turned out by the same artist in the K'ien-lung period (1736-95); in style and attributes they closely approach the Arhat paintings of that time. Both figures are characterized by the same

massive head, the same high helmet-shaped craniums, bulging eyes, large noses, heavy mustaches and beards. The Arhat in Fig. 1 sets his foot on the back of a lion (symbolizing the saint's power over the wild animals); in his right hand he holds a branch with fungus of immortality (*ling-chi*) which, strictly speaking, is a Taoist emblem, and in his left hand a fly-brush or chowry, an ancient emblem of royalty or rank, usually made of yak-tails or coir. The tip of the chowry tickles the lips of the lion who devotedly looks up to his master. A rosary is slung around his neck. His companion (Fig. 2) sets his left foot on the head of the three-legged mythical frog. He is represented in the act of conjuring a dragon from his alms-bowl, pointing at him a bead of the rosary which he holds between the thumb and index-finger of his right hand.

In each of the two figures illustrated in Plate V two Arhats are grouped together, each pair, including the base, being carved from a single piece of ivory. In the first group a monk hurls a dragon's head into the face of his frightened companion, who is suddenly interrupted in his prayers during which he was running off the beads of his rosary and burning incense. The counterpart of this figure presents a monk clasping his arm around his brother's shoulder and showing him a snake. Terror-stricken he screams aloud and presses hard his left foot on the tiger below who feels the force of his master's emotion. The conception of both groups is highly dramatic and emotional.

In A.D. 484 Jayavarman, king of Fu-nan (Camboja), sent Nagasena, an Indian monk, with a long letter to the emperor of China, offering as presents an elephant carved from white sandal-wood and two topes (stūpas) of ivory. The Museum is in the possession of an ivory seal from Siam presented by Miss C. Wicker; it is carved in the form of a tope, and such seals are still used by Buddhist monks. The design in

the seal is a cat amid plants; the cat was sacred to the monks as the animal exterminating the rats which threatened their sacred books with destruction; the domesticated cat was hence introduced by the Buddhists into China and all other countries of the Far East.

The esthetic needs of the scholar are cared for by the ivory-carver in the production of handsome writing-brushes provided with ivory handle and encased in a sheath of ivory. He is also fond of ivory foot-measures etched on the back with delicate floral designs and birds in colors, but, above all, delights in brush-holders (*pi tung*) as a suitable decoration of his desk. These are carved out of the central portion of the tusk in the round, and are decorated with designs in high relief of a plum-tree growing out of a rock and surrounded by bamboo-leaves (Plate VI), or are adorned with a genre-scene in flat relief, as that in Plate VII, which shows a horseman at night in a mountain-pass followed by a flag-bearer, a boy with a lantern lighting the path; the scenery is enlivened by pine-trees and clouds. Another ambition of the literary man is to possess an arm-rest of ivory (usually carved from bamboo) with elaborate designs; objects like these are used on the desk for resting the forearm while wielding the writing-brush.

The ivory objects of which the ancient Chinese were proudest are flat tablets used for ceremonial purposes and call *hu*. Six fine specimens of these coming down from the Ming dynasty (1368-1643) are placed on exhibition. These tablets carved from elephant tusks formerly played a prominent part in official life. In very early times they appear to have been made of bamboo, being suspended from the girdle which belonged to the dress of every young gentleman. They were used as memoranda for jotting down any notes. At a somewhat later epoch they were made of ivory and reserved for the organs of government, develop-

ing into insignia of rank. When a high official had audience at court, he respectfully held such an ivory tablet, clasping both his hands around the broader base, the upper narrow part being at the height of his mouth, so that his breath might not touch the imperial face. He had inscribed on the tablet whatever business he wished to report and submit to the emperor, and recorded on it the imperial replies or commands. The ancient Book of Rites (*Li ki*) contains this passage, "When the great prefect had washed his head and bathed, his secretary brought him the ivory tablet to write down his thoughts, his replies, and the orders of the prince."

Friar William of Rubruck, who sojourned among the Mongols from 1253 to 1255, relates as follows: "Whenever the principal envoy came to court, he carried a highly-polished tablet of ivory about a cubit long and half a palm wide. Every time he spoke to the Khan or some great personage, he always looked at that tablet as if he found there what he had to say, nor did he look to the right or to the left, nor in the face of him with whom he was talking. Likewise, when coming into the presence of the Lord, and when leaving it, he never looked at anything but his tablet." Under the T'ang dynasty (A.D. 618-906) the ivory tablets were round above and angular below, and were used by officials down to the sixth rank; those below the sixth rank had bamboo or wooden tablets. Under the Ming the ivory tablets were angular at both ends, and were granted to officials above the fourth grade; those of the fifth grade and below had wooden ones with painted designs. They were abolished under the Manchu. In Korea such tablets were used down to quite recent times. Yüan Shi-kai, toward the end of his presidency, is said to have attempted to introduce them again in connection with his scheme to restore the monarchy, but in this he failed.

Girdle-pendants of which the Chinese were formerly very fond were made of ivory also in the K'ien-lung period, but are rather scarce. The one illustrated in Plate IX, Fig. 6, is carved in the shape of the so-called "wooden fish,"—a sort of wooden drum used in Buddhistic temples to mark time in the recitation of prayers, the handle being formed by two dragon-heads. Another pendant (Plate X, Fig. 3) represents two bean-pods with tendrils and leaves, and that in Fig. 5 two boys, so arranged that the complete figure of a boy (altogether four) may be seen from every angle. A scent-box in the shape of a flower-basket is shown in Fig. 2 of Plate IX; it is carved in open work with peaches and pomegranates and consists of two halves joined together. It is filled with perfume and worn in front of the dress during the summer.

In ancient Rome parrots were kept in cages of gold, silver, and ivory (Statius,*Silvae*, II, 4, 12), but none of these has come down to us. From China we receive bird-cages entirely made of ivory rods and adorned with numerous small carvings of the same material. No other nation has been more considerate of the welfare of its pets and lavished on them the most precious substances and the most exquisite work that art could offer.

Crickets are kept by the Chinese for two purposes—to enjoy their melodious chirps and to train them as fighters. A cricket-fight is a great event, and large sums are staked on the champions. In Peking a special kind of gourd is raised to keep the insects during the winter. Many of these gourds are elaborately decorated and provided with finely carved lids of jade and ivory. Five covers of such cricket-gourds are reproduced in Plate X. That in Fig. 1 shows an open-work composition of plum-blossoms with two birds; that in Fig. 2, leaves and tendrils of a gourd, with a butterfly. The cover in Fig. 5 is surmounted

by three full figures of lions carved in the round and playing with a ball in the centre; the lower band is decorated with a row of peonies and leaves. A floral composition is spread over the cover in Fig. 6, and a dragon striving for the flamed pearl is carved in Fig. 7.

Ever since Europeans came into contact with the Chinese, their ivory fans have elicited unbounded admiration. John Barrow, private secretary to the Earl of Macartney on his mission to China in 1792, has the following interesting notice on this subject: "Of all the mechanical arts that in which they seem to have attained the highest degree of perfection is the cutting of ivory. In this branch they stand unrivalled, even at Birmingham, that great nursery of the arts and manufactures where, I understand, it has been attempted by means of a machine to cut ivory fans and other articles, in imitation of those of the Chinese; but the experiment, although ingenious, has not hitherto succeeded to that degree, so as to produce articles fit to vie with those of the latter. Nothing can be more exquisitely beautiful than the fine open work displayed in a Chinese fan, the sticks of which would seem to be singly cut by the hand, for whatever pattern may be required, or a shield with coat of arms, or a cypher, the article will be finished according to the drawing at the shortest notice. The two outside sticks are full of bold sharp work, undercut in such a manner as could not be performed any other way than by the hand. Yet the most finished and beautiful of these fans may be purchased at Canton for five to ten Spanish dollars."

Ivory beds were a prominent feature in many oriental countries. Mong Ch'ang-kün, a Chinese minister of state, who lived in the third century B.C., was famed for his extravagance and had as many as three thousand retainers, all of whom wore shoes embroid-

ered with pearls; he is reputed to have been the owner of an ivory bed which he presented to the prince of Ch'u. A certain Yü Yang, who lived at the time of the Liang dynasty (A.D. 502-556), was no less noted for his love of luxury; he possessed a bed inlaid with ivory, gold, and silver. On Java, the Chinese Annals of the T'ang dynasty report, princes and people had ivory beds; and the same is on record in regard to India, where couches and seats were inlaid with ivory. With reference to the city of Cambaya (now Cambay), the Portuguese traveller, Duarte Barbosa (A.D. 1518), writes, "A great quantity of ivory is used here in very cunning work, inlaid and turned articles such as bangles, sword-hilts, dice, chessmen and chess-boards; for there are many skilful turners who make all these, also many ivory bedsteads very cunningly turned, beads of sundry kinds, black, yellow, blue and red and many other colors, which are carried hence to many other places." Wooden beds with ivory inlays are still made at Ning-po in Che-kiang Province.

The opium-smoker has a particular veneration for ivory: he may use a pipe with ivory mouth-piece and ivory boxes to contain the drug (cf. Leaflet 18, pp. 24, 35); he may also avail himself of an ivory spatula for taking a pill of opium out of the box, and he may worship the "god of opium" in the form of an ivory image (figured by A. de Pouvourville, L'Art indo-chinois, p. 189). Tobacco-pipes of ivory are described and figured in Leaflet 18 (p. 22). Snuff-bottles were also made of this material, carved with designs or painted.

The concentric ivory balls which have attracted much attention and which are still turned out at Canton were manufactured as early as the fourteenth century under the name "devil's work balls." There is a tradition also that they were made in the palace of the Sung emperors. They are the result of patient

toil, the balls being carved one within the other. Good, old specimens are difficult to get; the modern ones are usually intended for the foreign market.

In India chessmen and backgammon were made of ivory at an early date (account of Masudi, A.D. 983). The Chinese make of ivory chessmen (Fig. 13), dice, dominoes, and many other games derived from the latter. The foreign craze for ma-jong has now caused nearly all available ivory to be absorbed for the manufacture of ma-jong sets, which has disorganized the whole ivory industry and unfortunately stopped the production of artistic carvings.

The main seats of the ivory industry are Canton, Amoy, Shanghai, Suchow, and Peking. As a rule, the objects are carved and sold in the same shop. Ivory is now preferred in its pure white state, and Canton workmen are successful in removing yellow tinges from ivory and restoring it to its pristine whiteness and brilliancy. On the other hand, there is no lack of methods of lending ivory a yellow-brown patina and making it appear old: for this purpose it is placed in a decoction of tobacco or tea leaves, or exposed to the fumes of burning incense.

Canton, for at least a century or more, has catered to foreign taste and produced immense quantities of ivory ware for export. Although many of these articles are marvels of patient workmanship and technical skill and ingenuity, they lack artistic feeling and finish; the carved concentric balls, models of boats, houses, temples and pagodas belong to this class. Others like brooches, chains, glove-boxes, etc., are entirely foreign to the Chinese, and are solely intended for the European or American market. Articles like these were strictly excluded from the ivory collection of the Museum, and only those made for and used by the Chinese were selected.

B. Laufer.

BIBLIOGRAPHICAL REFERENCES

BEVERIDGE, H.—The Emperor Jahangir's Treasures of Walrus and Narwhal Ivory. Indian Magazine, February, 1914, pp. 37-39.

BISHOP, C. W.—The Elephant and Its Ivory in Ancient China. Journal of the American Oriental Society, Vol. XLI, 1921, pp. 290-306.

DAWKINS, W. BOYD.—On the Range of the Mammoth in Space and Time. Quarterly Journal of the Geological Society, 1879, pp. 138-147.

HOWORTH, H. H.—The Mammoth and the Flood. London, 1887.

KUNZ, G. F.—Ivory and the Elephant in Art, in Archæology, and in Science. New York (Doubleday, Page and Company), 1916.

LAUFER, B.—Arabic and Chinese Trade in Walrus and Narwhal Ivory. T'oung Pao, 1913, pp. 315-364, with Addenda by P. Pelliot, pp. 365-370.

Supplementary Notes on Walrus and Narwhal Ivory. T'oung Pao, 1916, pp. 348-389.

Sino-Iranica, pp. 565-568 (with special reference to Persia).

LULL, R. S.—The Evolution of the Elephant. Yale University, Peabody Museum of Natural History, Guide No. 2, reprinted from the American Journal of Science, Vol. XXV, 1908.

LYDEKKER, R.—Mammoth Ivory. Annual Report of the Smithsonian Institution for 1899 (Washington, 1901), pp. 361-366.

MAYERS, F. W.—The Mammoth in Chinese Records. China Review, Vol. VI, 1878, pp. 273-276.

RANKING, J.—Historical Researches on the Wars and Sports of the Mongols and Romans: in which Elephants and Wild Beasts were Employed or Slain. And the Remarkable Local Agreement with the Remains of Such Animals Found in Europe and Siberia. London, 1826.

WATT, G.—Indian Art at Delhi, p. 173. Calcutta, 1903.

The Commercial Products of India, pp. 695-699. London, 1908.

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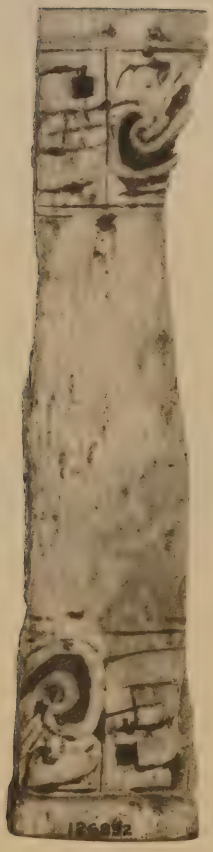

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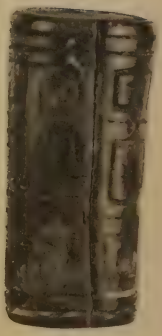


4

ARCHAIC IVORY CARVINGS (p. 9). CHOU PERIOD (1122-247 B.C.).
About two-thirds actual size.
Capt. Marshall Field Expedition to China, 1923.

IVORY STATUETTES OF THE GODDESS KWAN-YIN AND TUNG-FANG SO (p. 69). MING PERIOD (1368-1643).

About one-half actual size.

Capt. Marshall Field Expedition to China, 1923.

IVORY STATUETTE OF A BUDDHIST MONK (p. 70). K'ANG-HI PERIOD (1662-1722).
About one-half actual size.
Capt. Marshall Field Expedition to China, 1923.

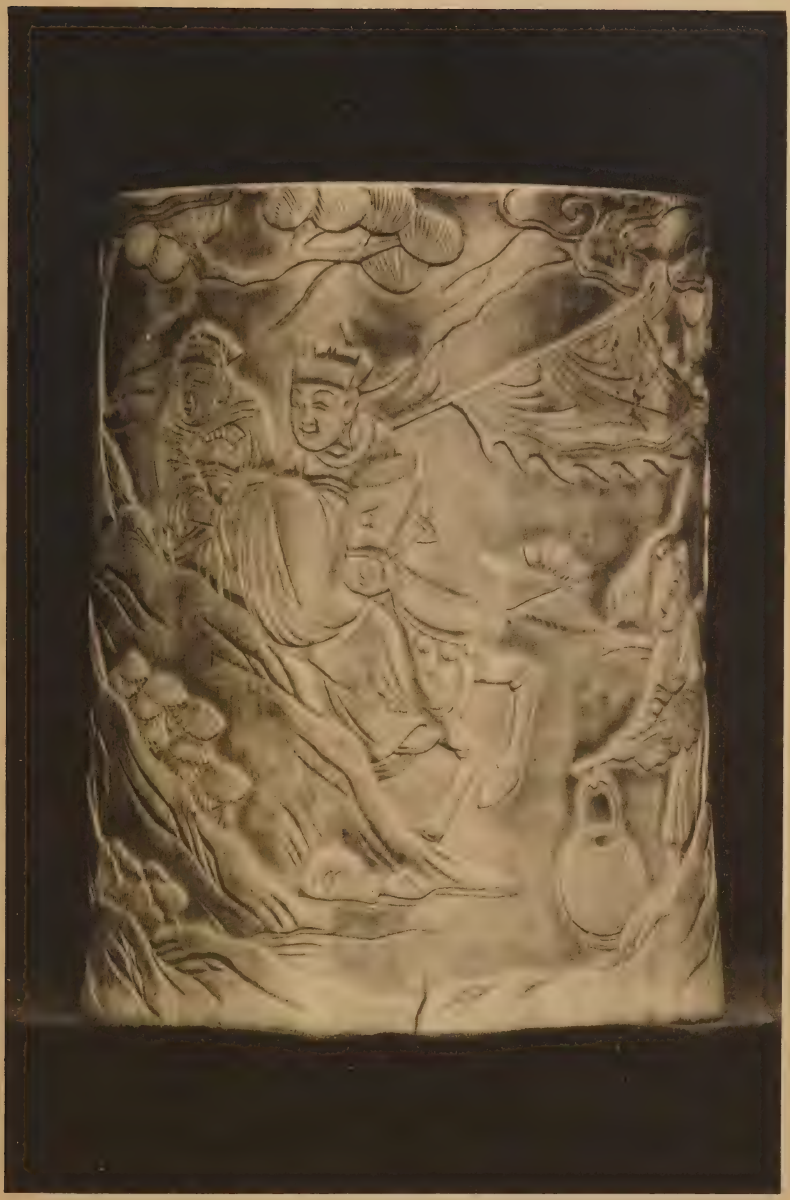
IVORY STATUETTES OF BUDDHIST SAINTS (p. 70). K'IEN-LUNG PERIOD (1736-95).
About one-half actual size.
Capt. Marshall Field Expedition to China, 1923.

IVORY STATUETTES OF BUDDHIST SAINTS (p. 71). K'IEN-LUNG PERIOD (1736-95).
About one-half actual size.
Capt. Marshall Field Expedition to China, 1923.

IVORY BRUSH-HOLDER WITH DESIGNS IN HIGH RELIEF (p. 72).
K'IEN-LUNG PERIOD (1736-95).

Five inches high.

Capt. Marshall Field Expedition to China, 1923.



IVORY BRUSH-HOLDER CARVED WITH PICTURES IN RELIEF (p. 72).
K'IEN-LUNG PERIOD (1736-95).
Five and three-fourths inches high.
Capt. Marshall Field Expedition to China, 1923.

PALACE FAN PLAITED FROM IVORY THREADS AND DECORATED WITH FLOWERS CARVED FROM IVORY AND COLORED (p. 68). K'IEN-LUNG PERIOD (1736-95).

Ten inches high.

Capt. Marshall Field Expedition to China, 1923.

1, DISH OF WALRUS IVORY. 2, SCENT BOX, K'IEN-LUNG PERIOD. 3, DESK ORNAMENT OF MAMMOTH IVORY. 4, COVERS OF WALRUS IVORY FOR CRICKET GOURDS. 6, GIRDLE PENDANT, K'IEN-LUNG PERIOD (pp. 67, 74).

About one-half actual size.

Capt. Marshall Field Expedition to China, 1923.

1, 2, 4, 6, 7, IVORY COVERS FOR CRICKET-GOURDS.
3, 5, IVORY GIRDLE PENDANTS (pp. 74, 75).
About two-thirds actual size.
Capt. Marshall Field Expedition to China, 1923.